

2.5D Fiber Laser Marking Machine Manual



Shenzhen Scotle Technology Group Limited

中国广东深圳龙岗区坂田街道南坑社区雅园路 5 号创意园 Y1-2F-14, 邮编 518129
No.14, 2F, Building Y1, Bantian Street Creative Park, Longgang District, Shenzhen,
Guangdong, 518129 China (Mainland)

电话 TEL: +86-755-25901496 传真 FAX: +86-755-83692580



Contents

1.Safety Information	2
2. Reference standards	4
3.Machine introduction	4
4.Packing List	5
5.Machine operation	6
5.1 Power on/off procedure	6
6.Software & Driver installation	8
6.1 USB driver installation	8
6.2 Installation of the software	10
7. 2D Marking	15
7. 1 Focus setting	15
7.2 Software & machine connection	16
7.3 Field lens replacement	17
7.4 Parameter setting	20
8. 2.5D Marking (Yin/Yang Marking)	20
8.1 2.5D Yin (Deep) Marking - 3D File Format	21
8.2 2.5D Yang (Relief) Marking - 3D file format	26
8.3 2.5D Yin/Yang Marking - bitmap file format	29
9. Rotary axis Setting	32
9.1Vector image marking	36
10.How to switch back to Z-axis settings	39
11.Precautionary note	40
12.Q&A	41



1.Safety Information







Laser marking machine is a Class 4 laser product with dangerous, **the NOHD distance is 20M**, invisible laser radiation. This product emits infrared laser radiation with a wavelength of 1064nm, which can cause damage to eyes and skin directly or indirectly exposed to such light intensity. This infrared radiation is invisible, and the laser beam can cause irreversible damage to the retina or cornea. Before operating the laser marking machine, be sure to wear appropriate and certified 1064nm near-infrared band laser protective glasses. **the glasses should conform to OD6+ standard;**

Important:

- ◎ Never look directly at the fiber output connector, and make sure to wear appropriate protective goggles when using the laser to avoid injury.
- ◎ Do not open the laser, because there are no product parts or accessories for users to use inside the laser.
- ◎ When using this product, please use a properly grounded power supply and normal voltage.
- ◎ Before starting the laser product, please ensure that the ambient temperature and humidity are within the specified range.
- ◎ Do not expose the product to an overly humid environment.
- ◎ The laser is cooled by air. Please ensure that the ambient air is dry and clean.
- ◎ Operations or adjustments beyond the scope specified in this manual may cause dangerous radiation damage.
- ◎ Keep the output galvanometer clean. After each use, please cover the protective cover. Do not touch the field lens with your hands, and do not use any solvent to clean the field lens. When necessary to clean and maintain the lens, be sure to use lens paper. Warning:
- ◎ Operations or adjustments beyond the scope specified in this manual may cause radiation damage.

As shown in the table below, all safety warning signs (not limited to those affixed to the body of the laser) during the operation of the laser marking machine are included:

Safety signs	Description
	<p>AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION VISIBLE AND INVISIBLE LASER RADIATION</p>
	<p>LASER LAUNCH FROM HERE TEXT WITH THE LASER RADIATION WARNING SYMBOL INDICATES A POTENTIAL PERSONAL HAZARD.</p>

	<p>EMERGENCY STOP SWITCH FOR LASWER SOURCE</p>
	<p>DANGER! ELECTRIC WORDS MARKED WITH AN ELECTRICAL WARNING SYMBOL INDICATE A POTENTIAL PHYSICAL HAZARD.</p>
	<p>TEXT WITH THE LASER RADIATION WARNING SYMBOL INDICATES A POTENTIAL PERSONAL HAZARD.</p>
	<p>THE SYMBOL INDICATES THAT PERSONNEL MUST WEAR LASER SAFETY GLASSES (PERSONAL PROTECTIVE EQUIPMENT) TO PREVENT LASER RADIATION HAZARDS.</p>
	<p>ALTERNATIVE LABEL FOR LASER APERTURE</p>
	<p>EXPLANATORY LABEL</p>

Product name: Fiber laser machine
 Manufacturer: Shenzhen Scotle Technology Group Ltd.
 Address: Y1-214, Bantian Creative Park, Longgang District, Shenzhen City, Guangdong Province



Company: E-CrossStu GmbH
 Address: Felix-Dahn-Str 4, 70597 Stuttgart
 Mail: E-CrossStu@web.de
 Phone: +49 69332967674



Huizhou Yunsheng CNC Equipment Co., Ltd.

Machine: Fiber Laser Machine

Brand: Ovsuqu Model NO. : FL-200W
Power: 200W Weight: 63KG
Origin: China Mfg. year: 2024.5

Address: 5th Floor, Building A, Tianhai Innovation Technology Park, Xihu Village Committee, Qiluchang Street, Huiyang District, Huizhou City, China

TEL: +86 13244753448 TEL: +86 15820760539

2. Reference standards

IEC 60825-1:2014

EN ISO 12100:2010; EN 60204-1:2018

EN ISO 11553-1:2020+A11:2020

EN ISO 12100:2010;

EN 60204-1:2018

EN ISO 11553-1:2020+A11:2020

FDA number: 2320736-000

2. **Caution – Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.**

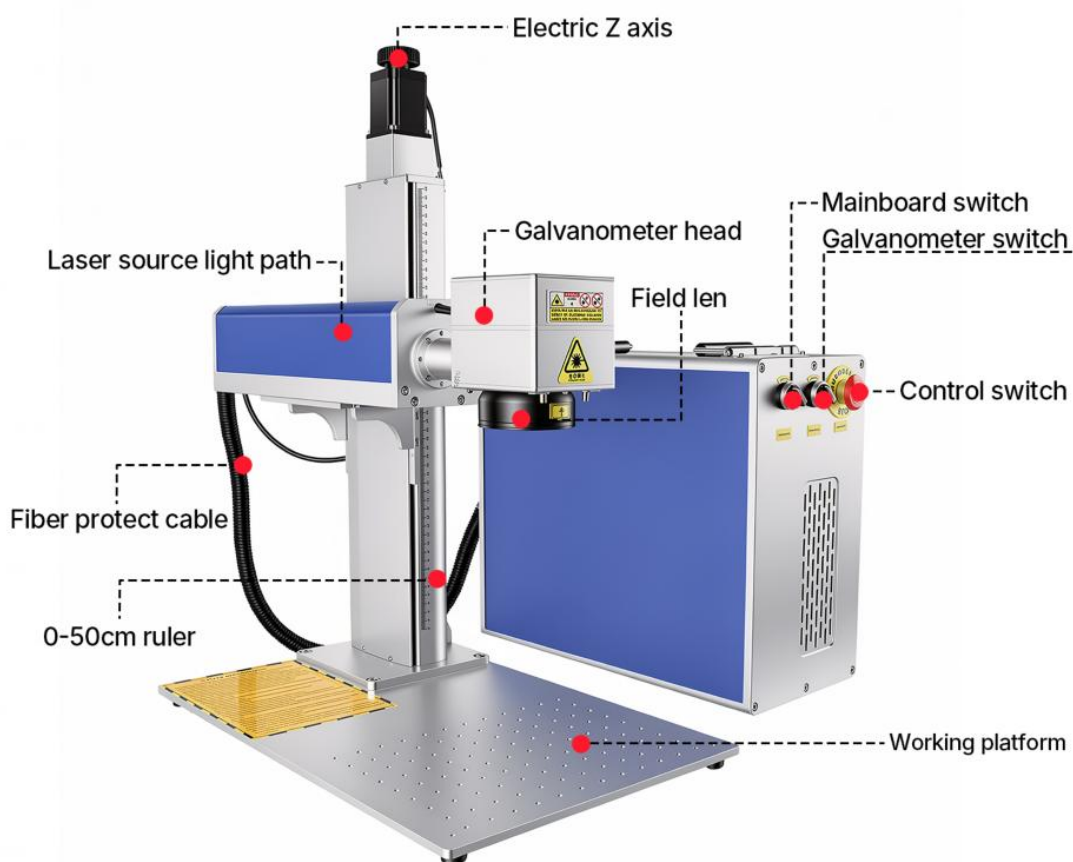
3. **The laser safety classification of this product is based on EN 60825-1: 2014+A11: 2021.**

4. **The level of laser radiation emitted through the laser aperture exceeds Class**

Please note:

© According to EU and national standards and requirements, lasers must be classified according to their output power and laser wavelength. All high-power MFSC series laser products belong to Class 4 products (according to EN 60825-1, Chapter 8)

3. Machine introduction



4.Packing List



80D Rotary Axis (Optional)



Goggles



Data Cable + Power Cord



Foot Switch



U Disk (With software)



Wrench & Position strip

5. Machine operation

5.1 Power on/off procedure



Power-on procedure: First, rotate the red Laser switch clockwise. The red emergency stop button will pop up. Then, rotate the two black buttons to the right side. The machine power on.

Power-off procedure: First, rotate the two black buttons to the left side. Then, press the red button in. The machine power off.

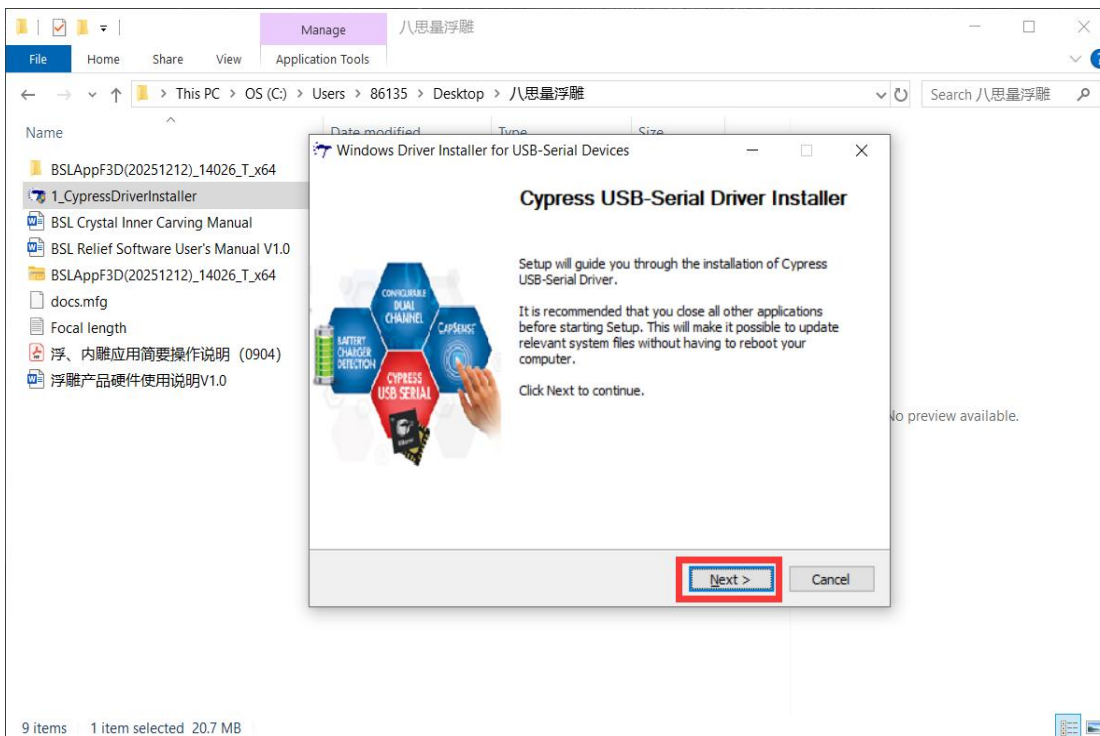
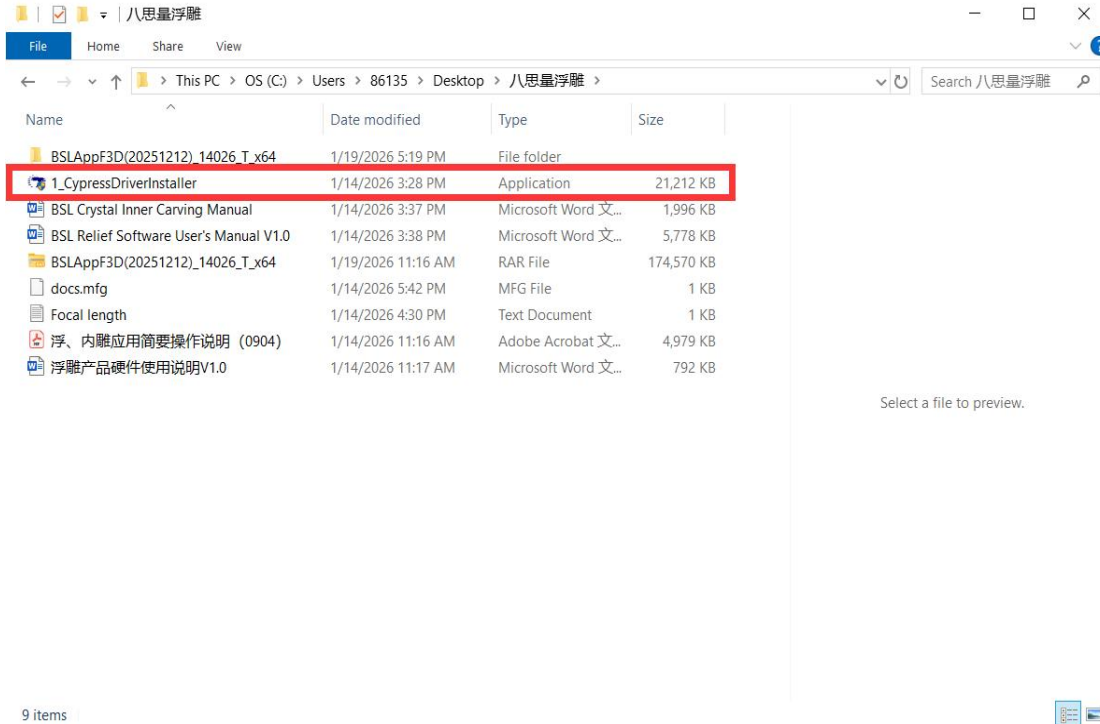
Emergency shutdown: Fast press the red button in, and then rotate the two black buttons to the left side.

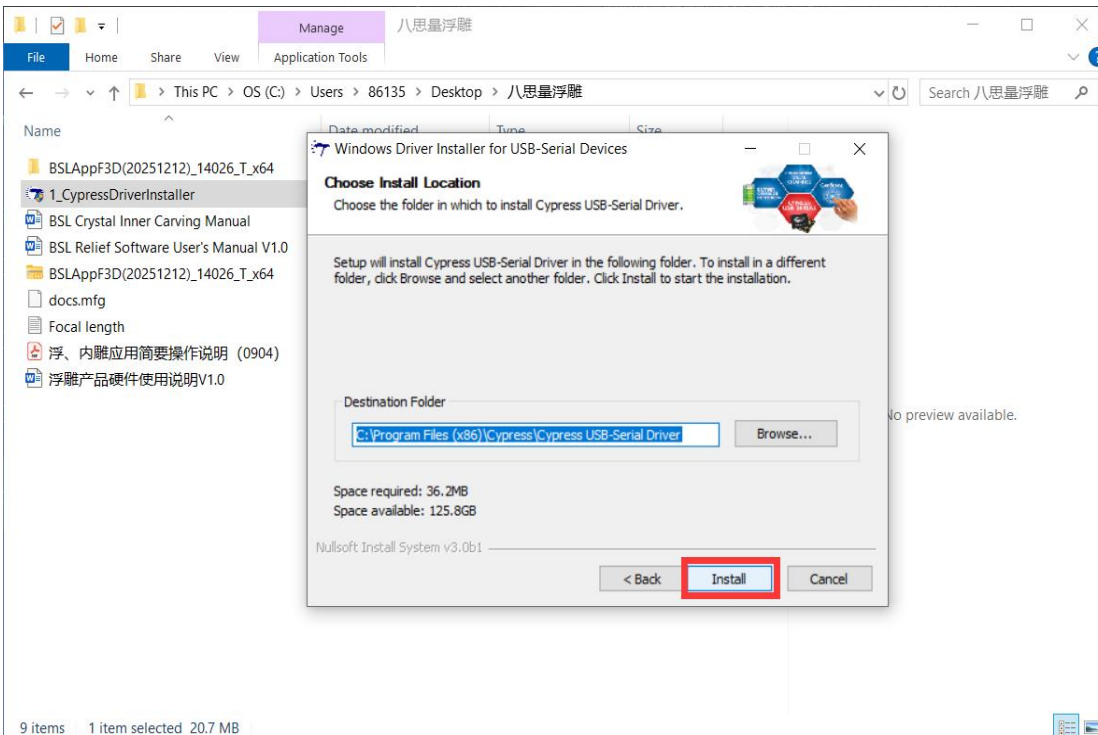
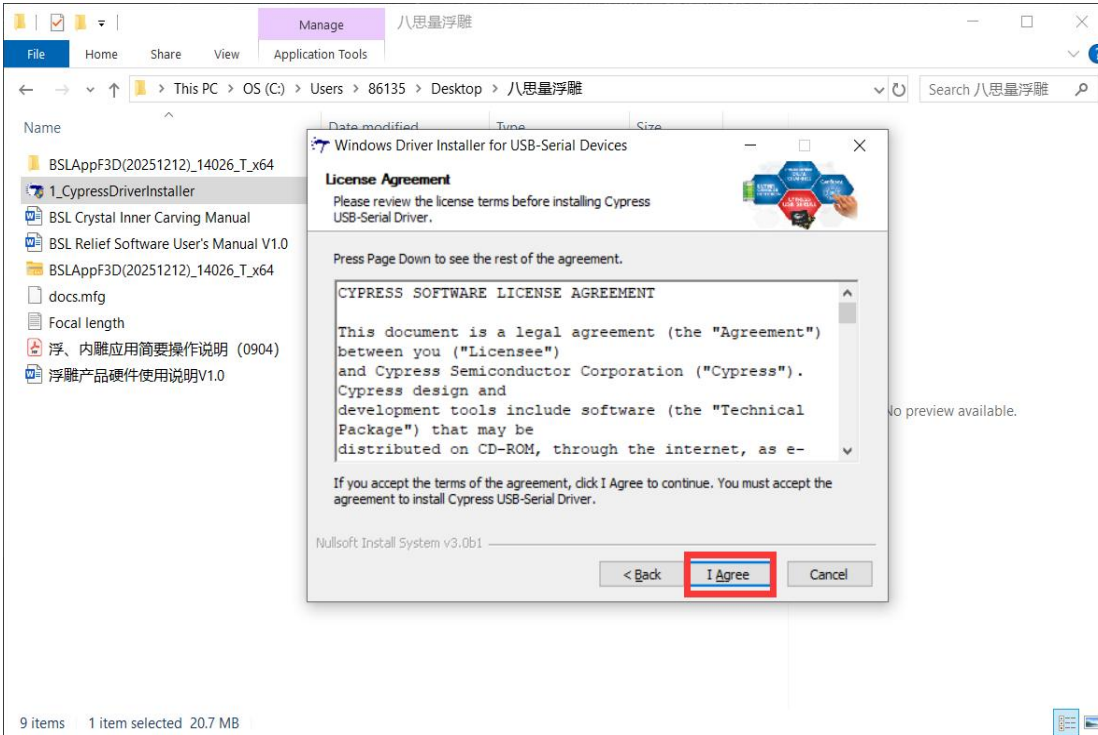


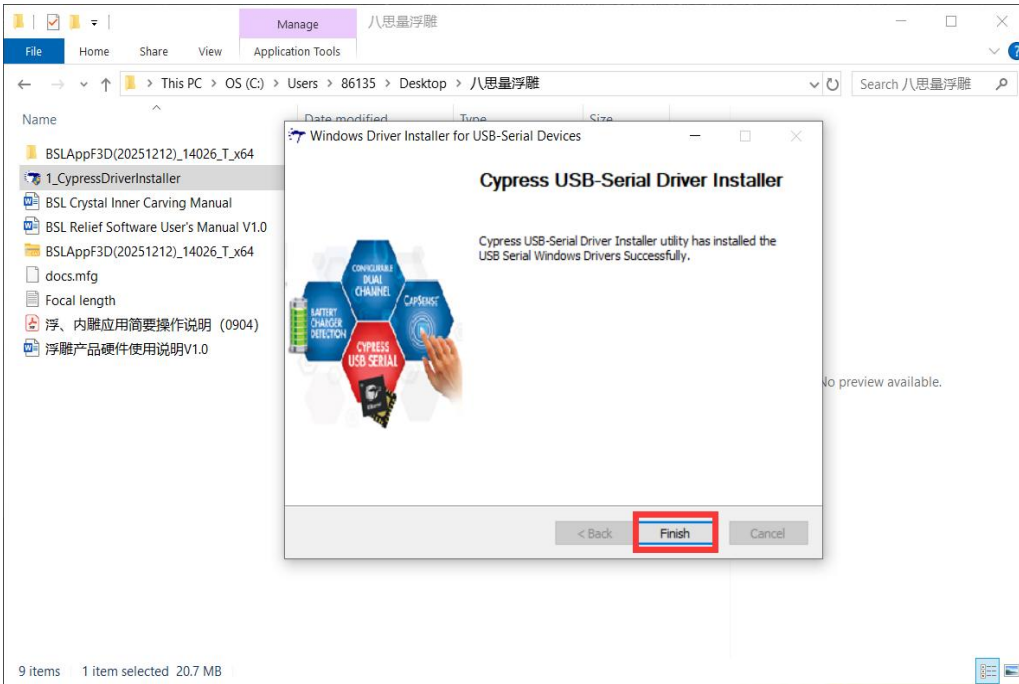
If you need to use the rotary axis, you need to remove the cable of the Z-axis and replace it with the cable of the rotation axis for use.

6. Software & Driver installation

6.1 USB driver installation



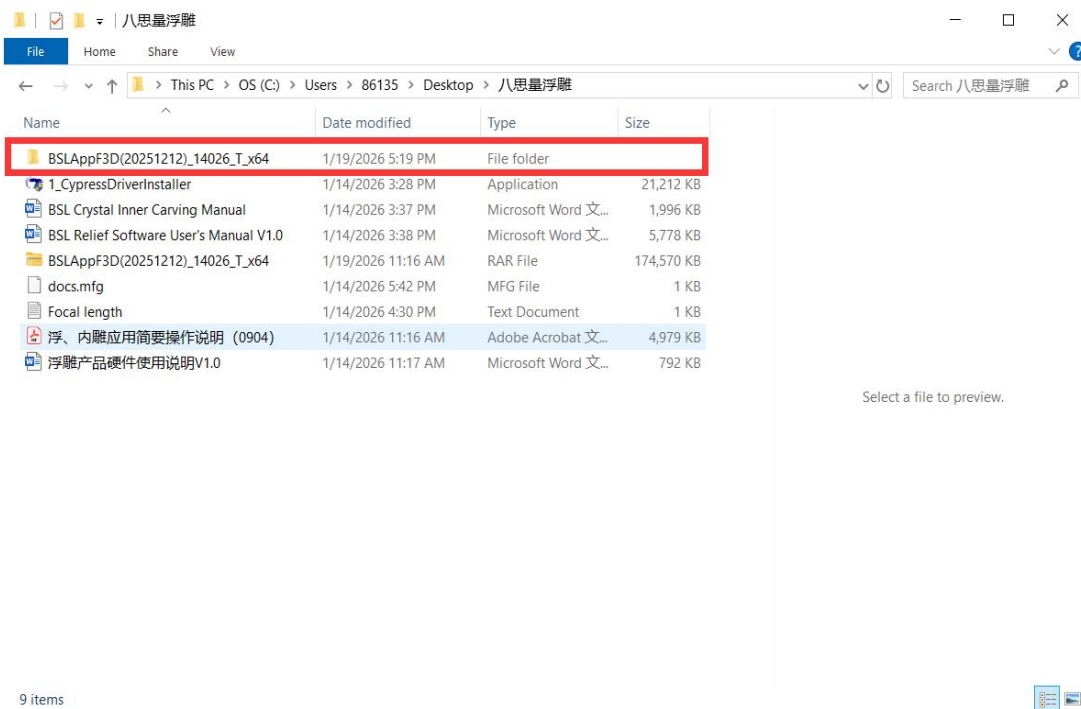


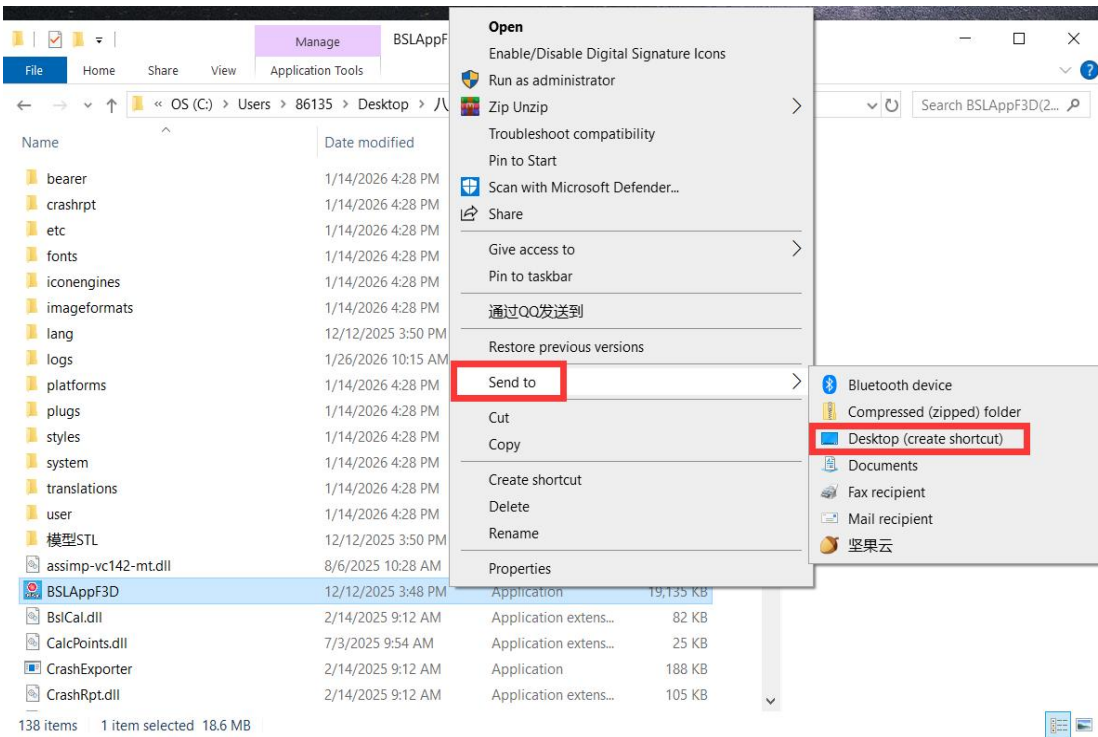
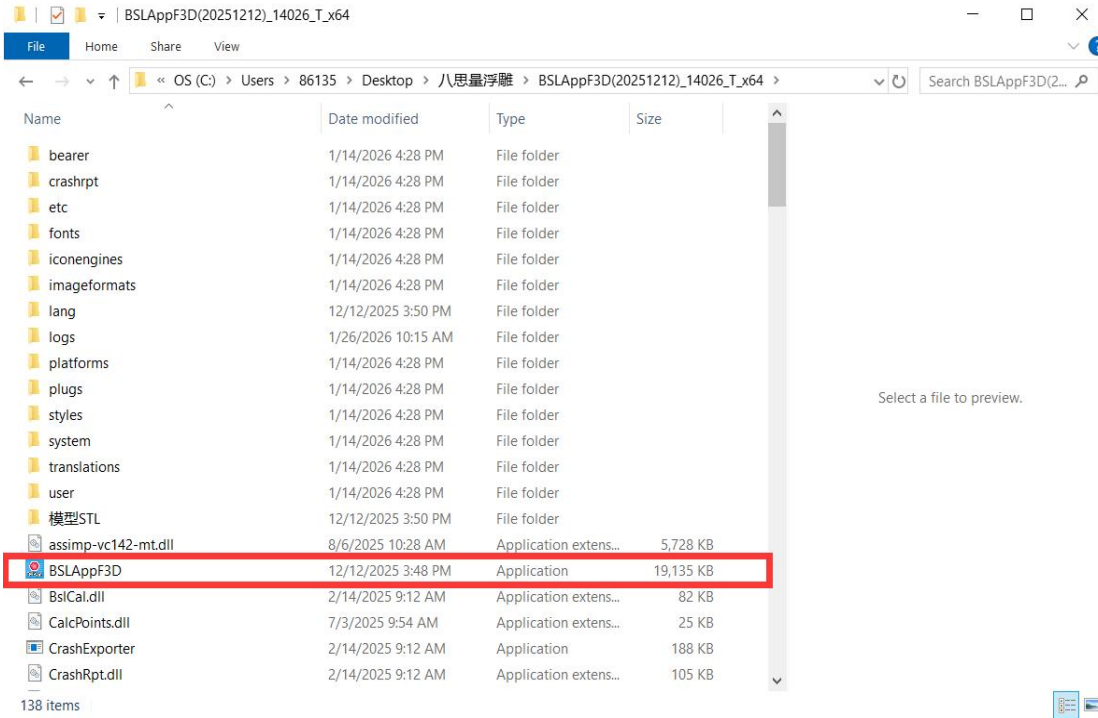


Click "Finish" and the USB driver installation is complete.

6.2 Installation of the software

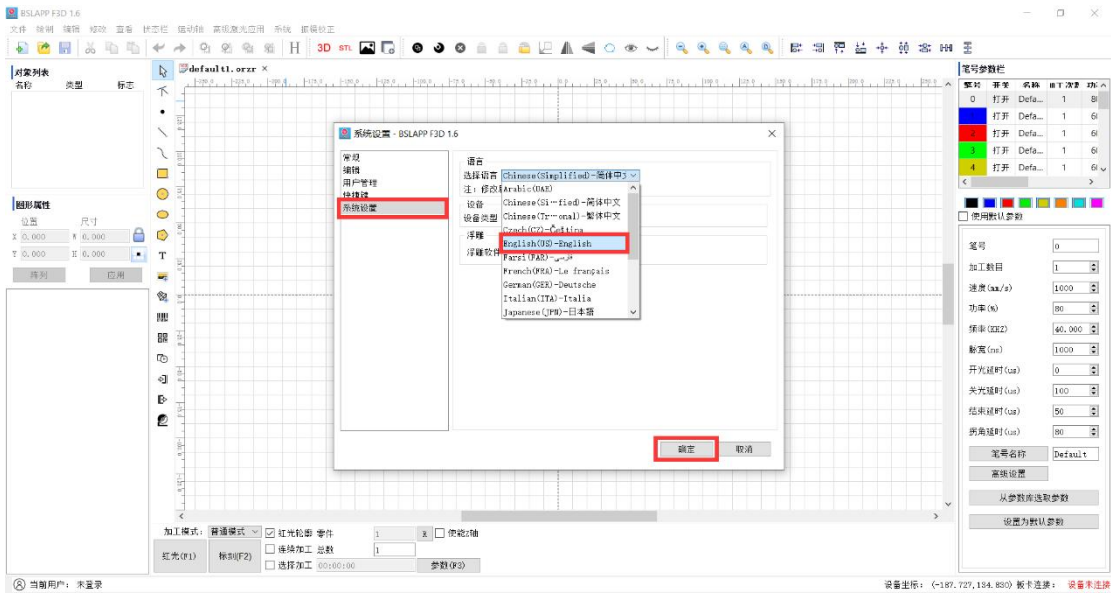
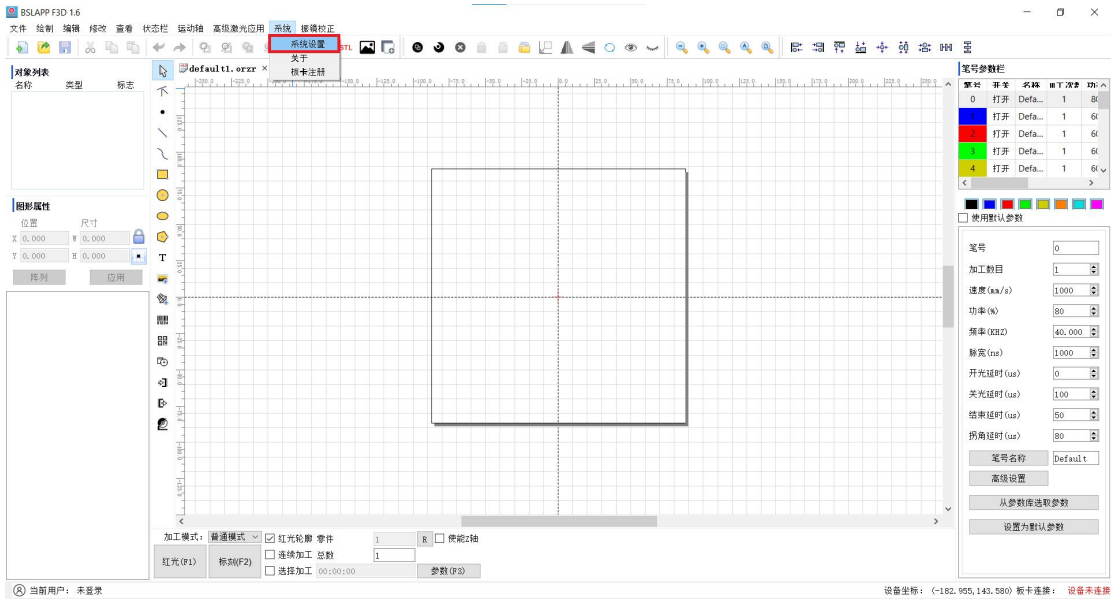
6.2.1 Create a shortcut (After installing the driver, you can directly open the software)

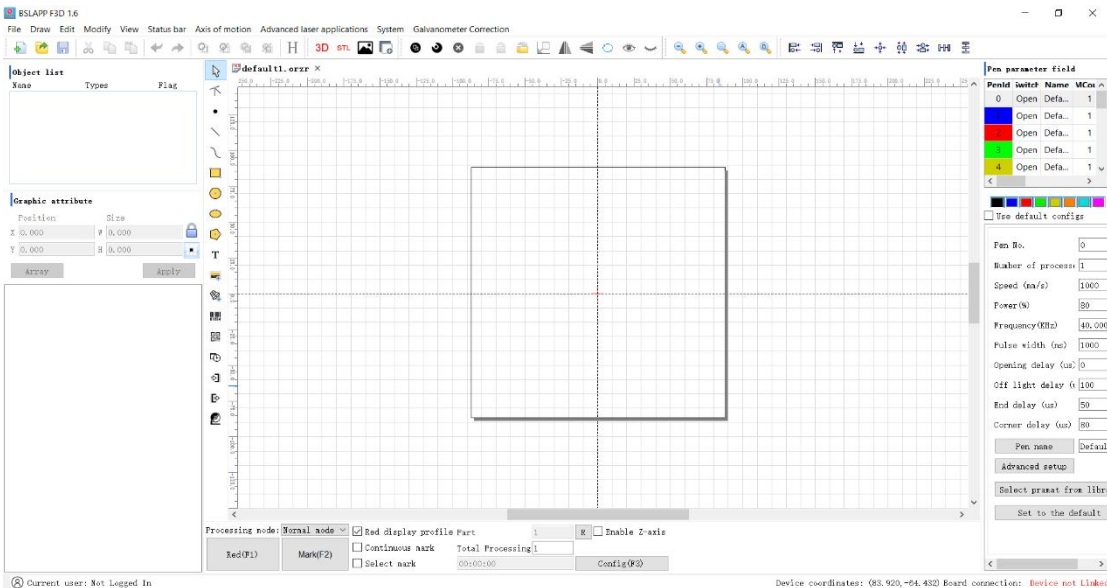
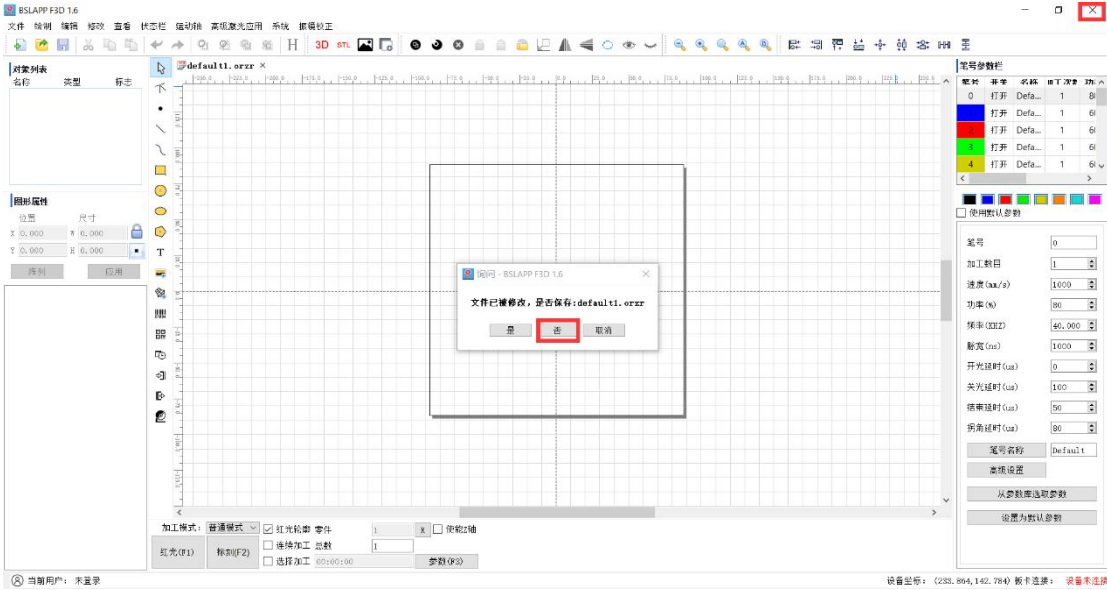




Send the software shortcut to the desktop, so you can open the software by double-clicking it in the future.

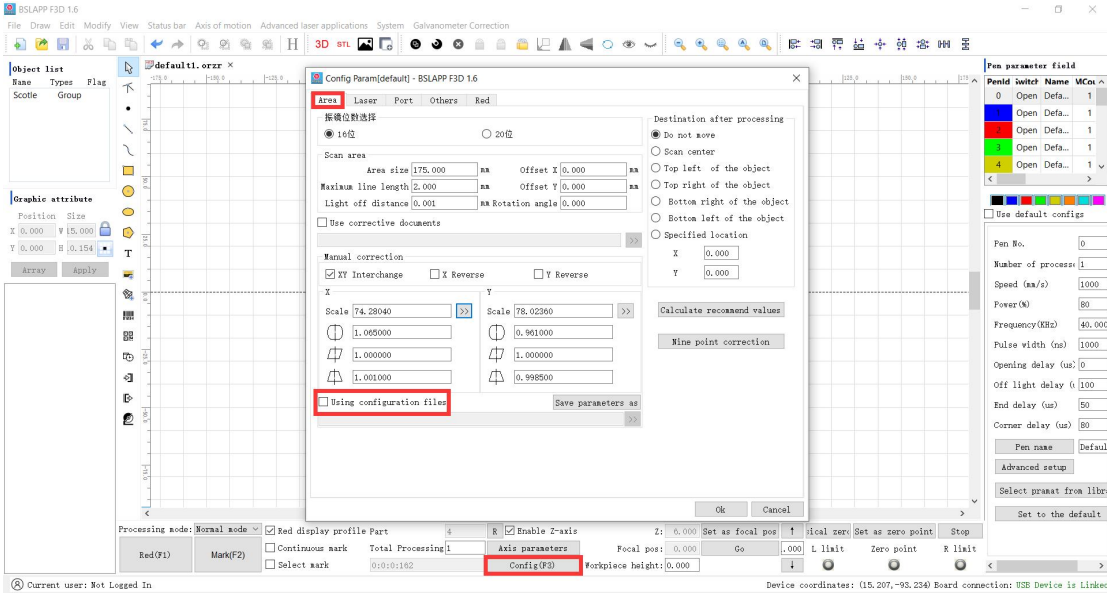
6.2.2 Switch to the English version





Then close the software and reopen it, and it will successfully change to the English version.

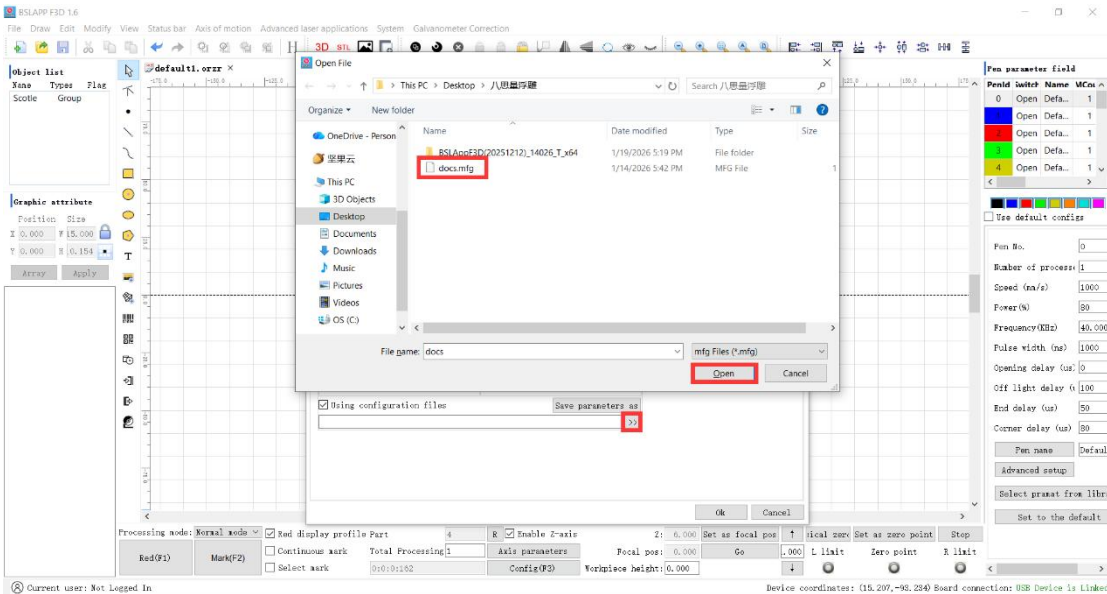
6.2.3 Import the galvanometer correction file

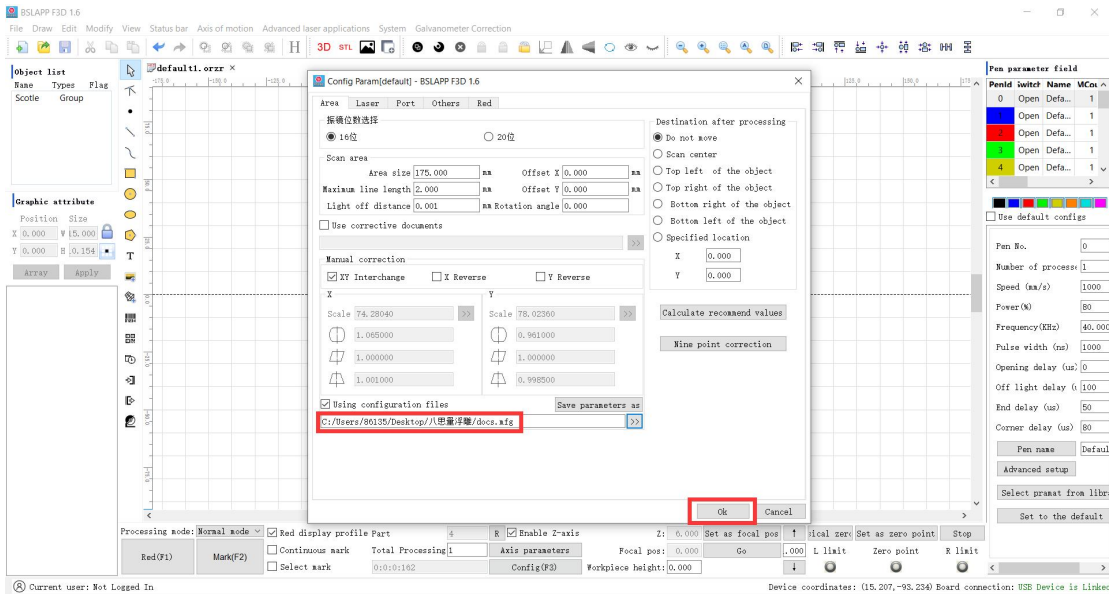


First, click the button below **Config (F3)**

Then click 'Area', Then check the box Using configuration files

Then click **>>** import File





After importing the file, click OK to complete the import process.

7. 2D Marking

7. 1 Focus setting

This way just fit for the filed lens which come with machine. After you change new filed lens and can't use this way to adjust focus length .

This machine has double red lights for positioning, no need focusing ruler. Double red light help customers make focus quickly and easily.

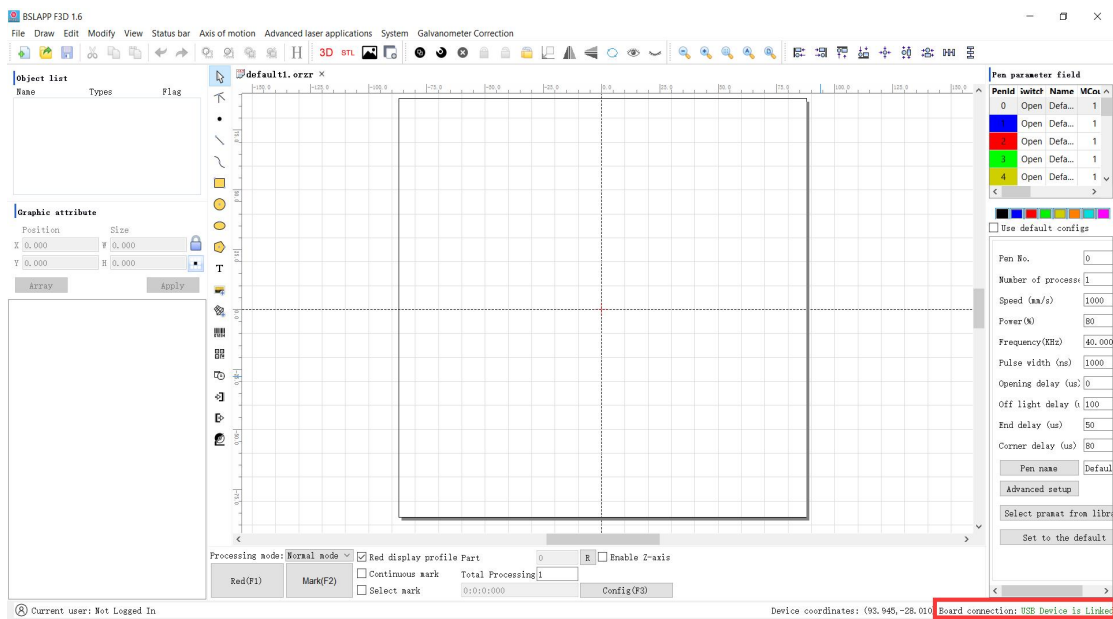
Step 1: Open the lid of Field lens and press the button;

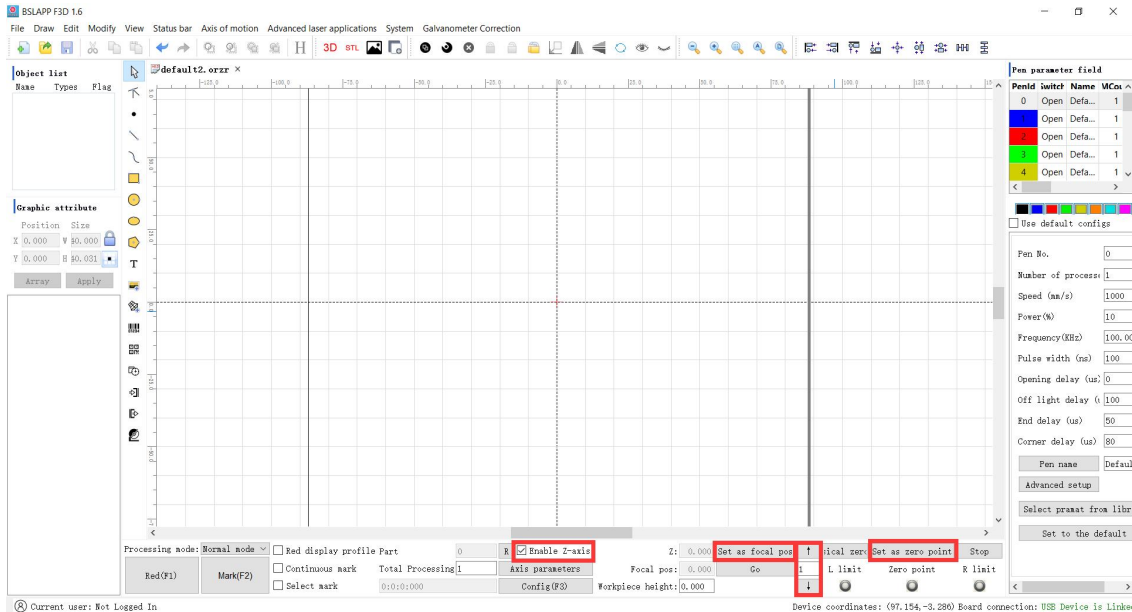
Step 2: When you turn on the machine and complete the software installation, you will see two red light spots on your work table. When the two red lights overlap, it is the best focal length.



7.2 Software & machine connection

1. After opening the software, check whether the device is connected normally in the lower right corner.








Check Enable Z-axis Enable Z-axis ,click Set as zero point ,



1

 The number entered in the box is the size(mm) of the Z-axis movement after click the up and down arrows.

Click Up  or  ,then check the position of the two red lights each time until they overlap.

When the machine is in optimal focus,click Set as zero point and Set as focal pos ,In this way, when the material is at the same height, if the Z axis moves, there is no need to find the focus again.Click Go automatically find focus

7.3 Field lens replacement

Step1: Hold the field lens and then turn the field lens clockwise

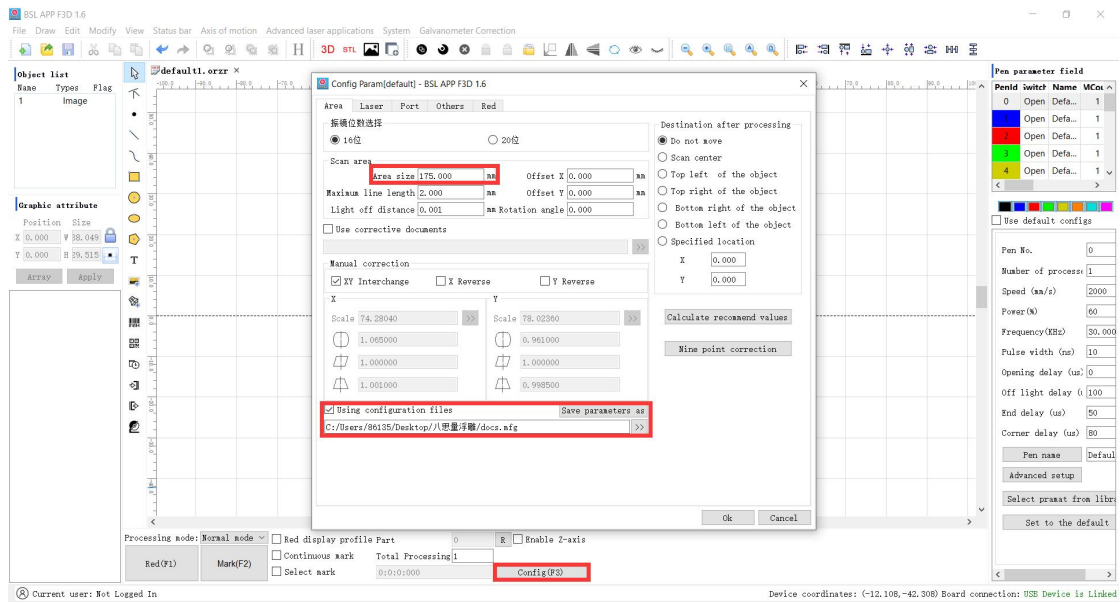


Step2: please open the machine and software,after replacing the field lens, first

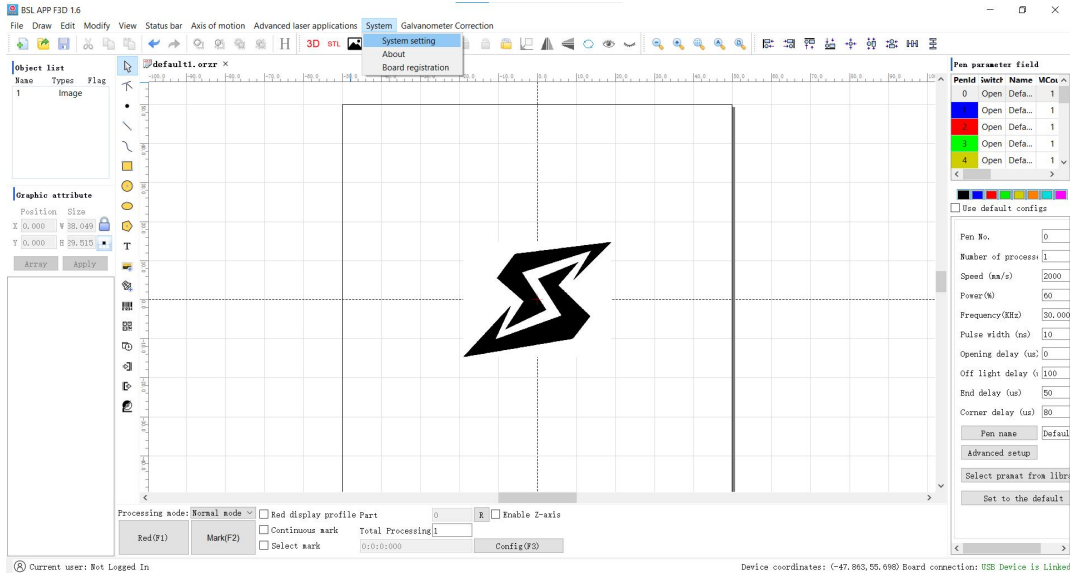
click **Config(F3)**, Area size mm Enter the size of the field lens that needs to be replaced in software,if is 175*175mm,change the "size(mm)" to 175.

Using configuration files

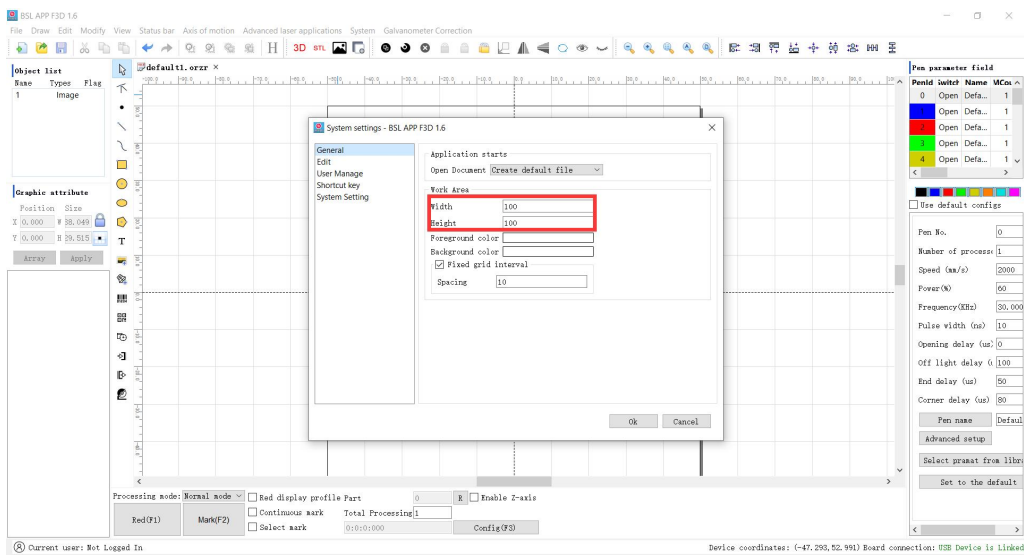
Import the corresponding field lens configuration file.



Click **System setting**

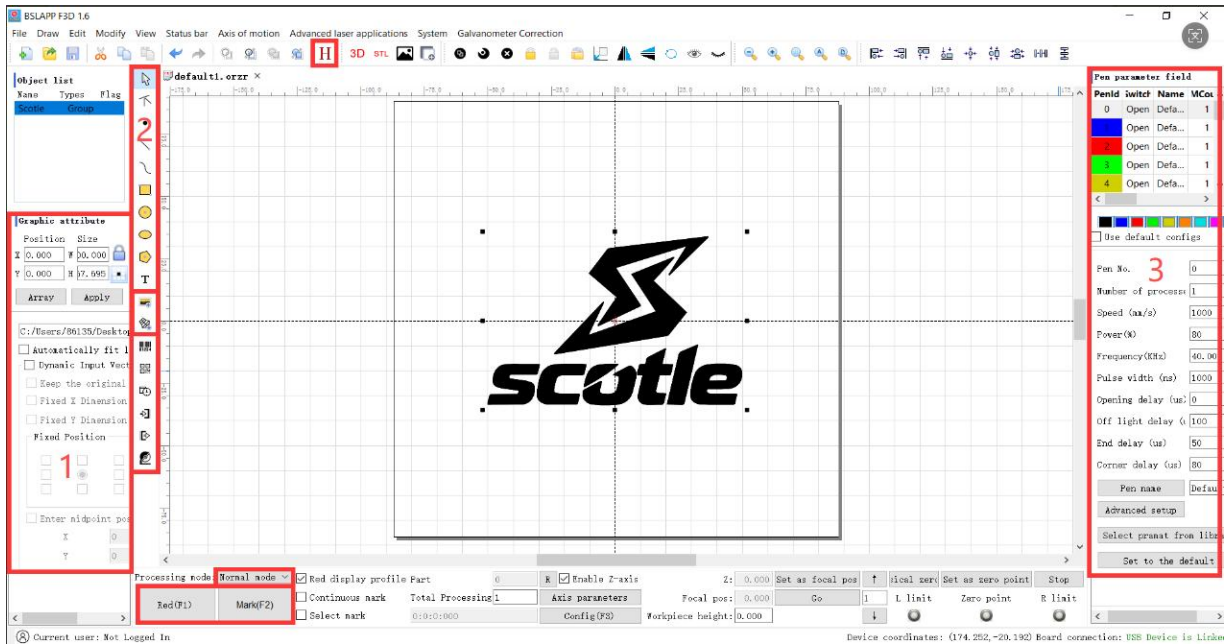


Modify the size of the replacement rear field lens



Step3: Readjust the focus (Refer to the focus setting way)

7.4 Parameter setting



In the box marked 1, you can edit the properties of the marked content (size, position, etc.). In the box marked 2, this column is the drawing column, which can draw graphics. click



(size, position, draw text and

import bitmap, click  import vector graphics

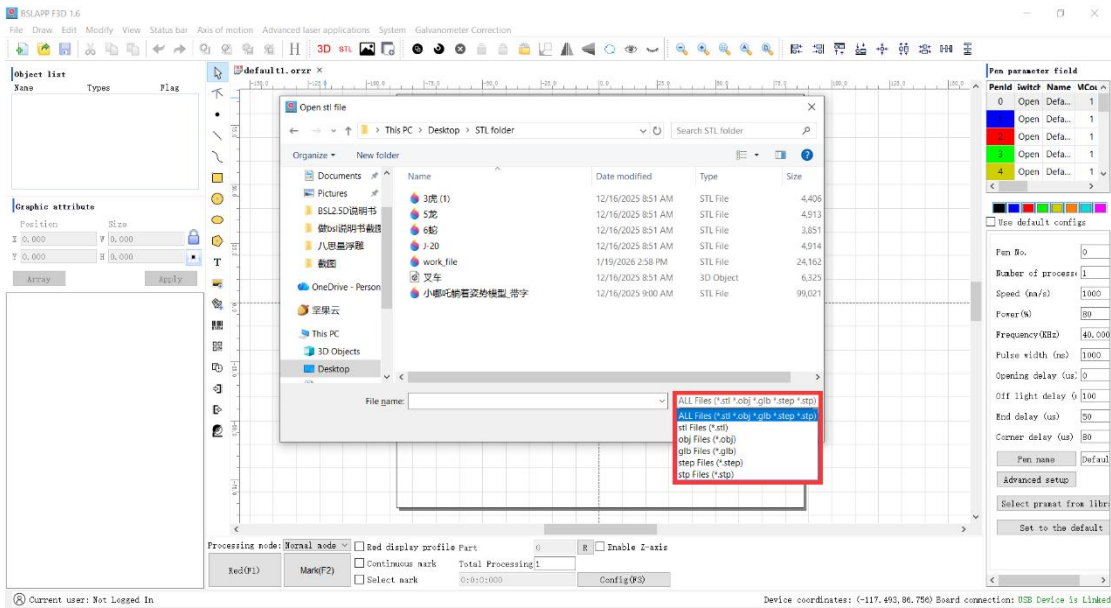
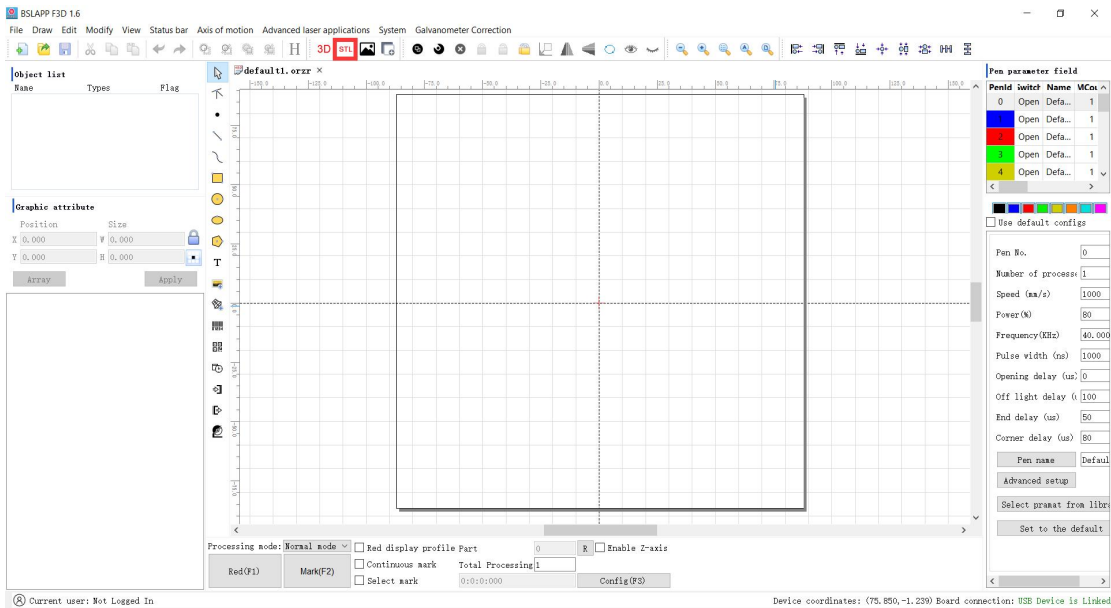
In the box marked 3, you can set different parameters in different colored pen numbers, and then quickly select the required pen number parameters for marking.

Please note: Be sure to choose Normal mode



After the focus is confirmed and the parameters of the graphic and laser marking are confirmed to be correct, click Red(F1) view marker location and marked content, then click Mark(F2) to begin marking.

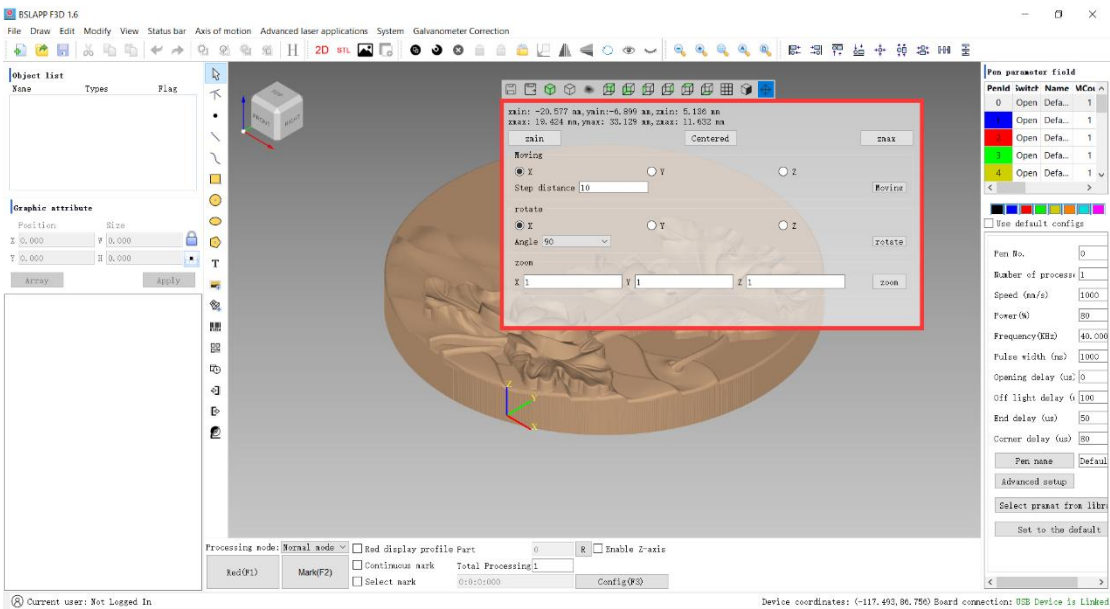
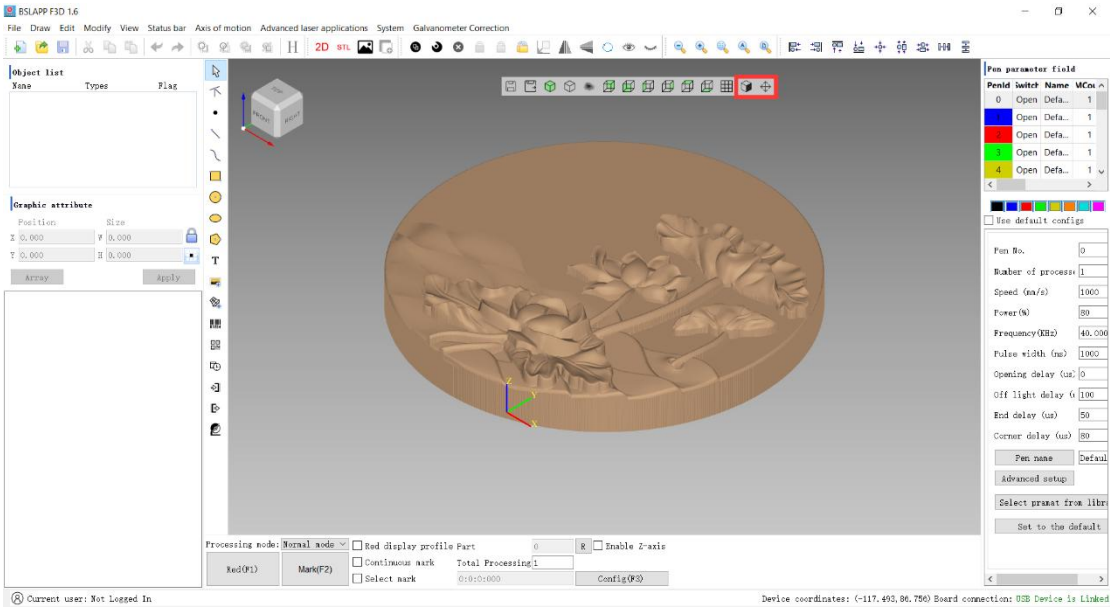
8. 2.5D Marking (Yin/Yang Marking)

8.1 2.5D Yin (Deep) Marking - 3D File Format

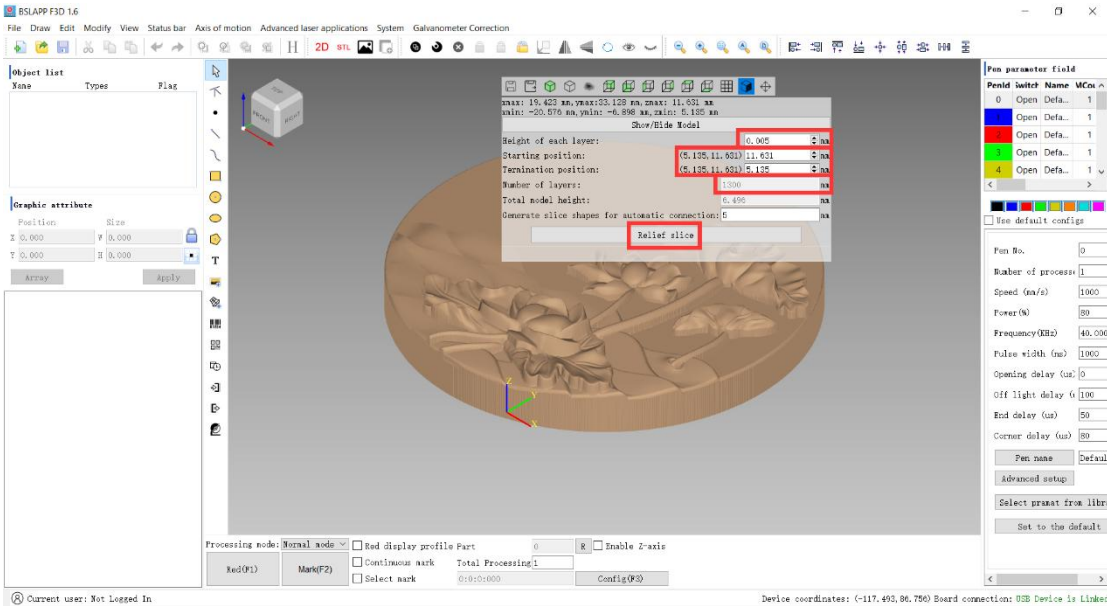


Step 1: Click **STL** to import 3D file format

Step 2:  the Slice processing of 3D models,  the Adjustment of 3D model position and size

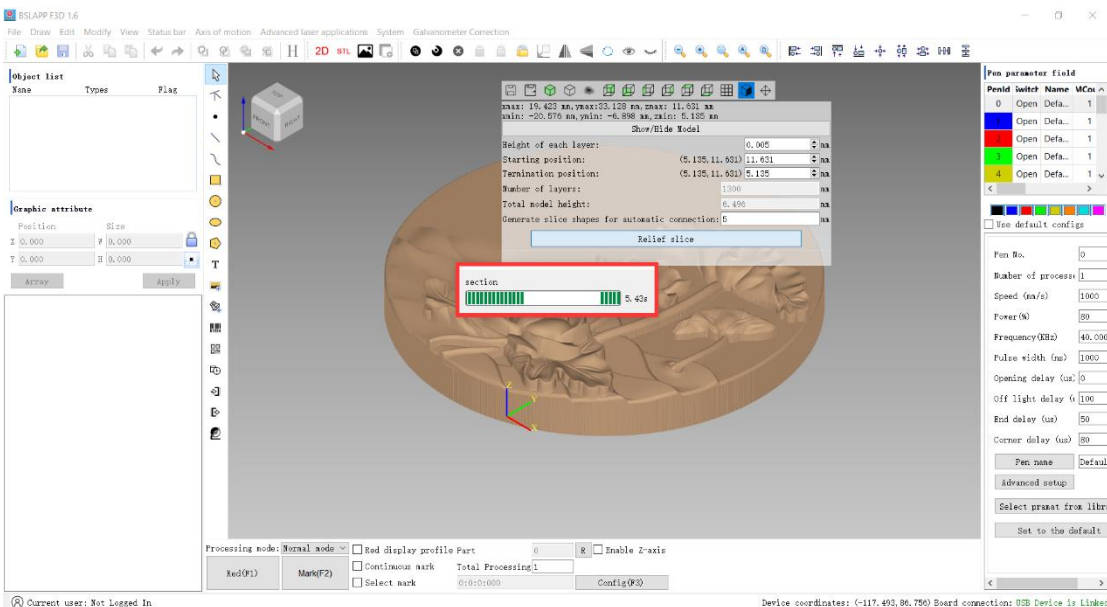


Step 3 Adjust the 3D graphics 's size

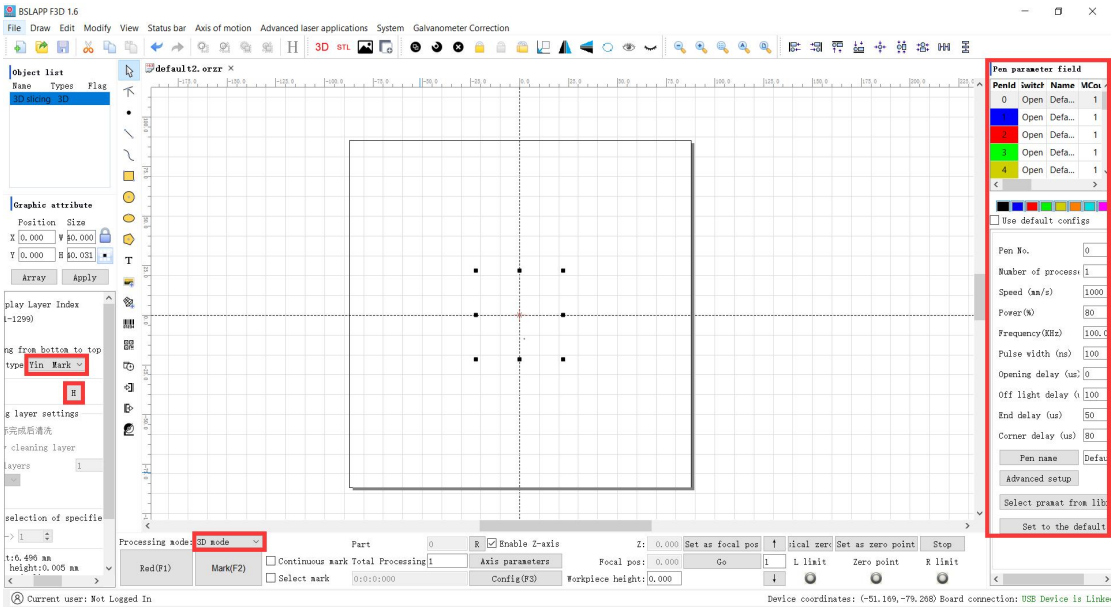


Height of each layer: The cutting height determines Number of layers: The total number of layers to be cut, the smaller the layer height setting, the more layers to be cut, and the larger the layer height setting, the fewer layers to be cut.

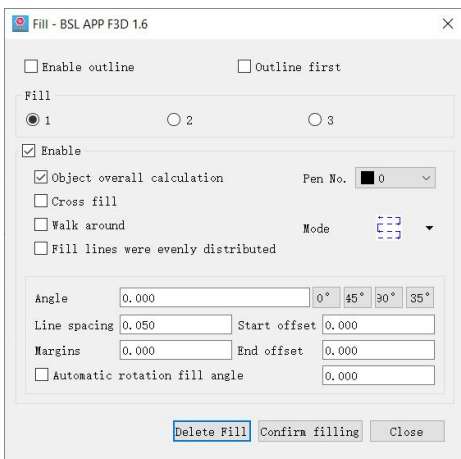
Starting position:
Termination position: If you donot not set, it defaults to cutting from top to bottom



After confirming the slicing parameters, click Relief slice Waiting for slicing to complete

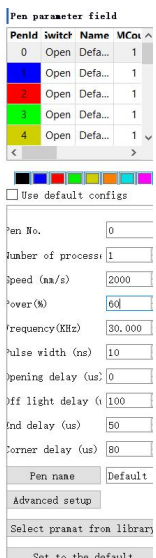


Select **Yin Mark** and then click **H** perform slice filling



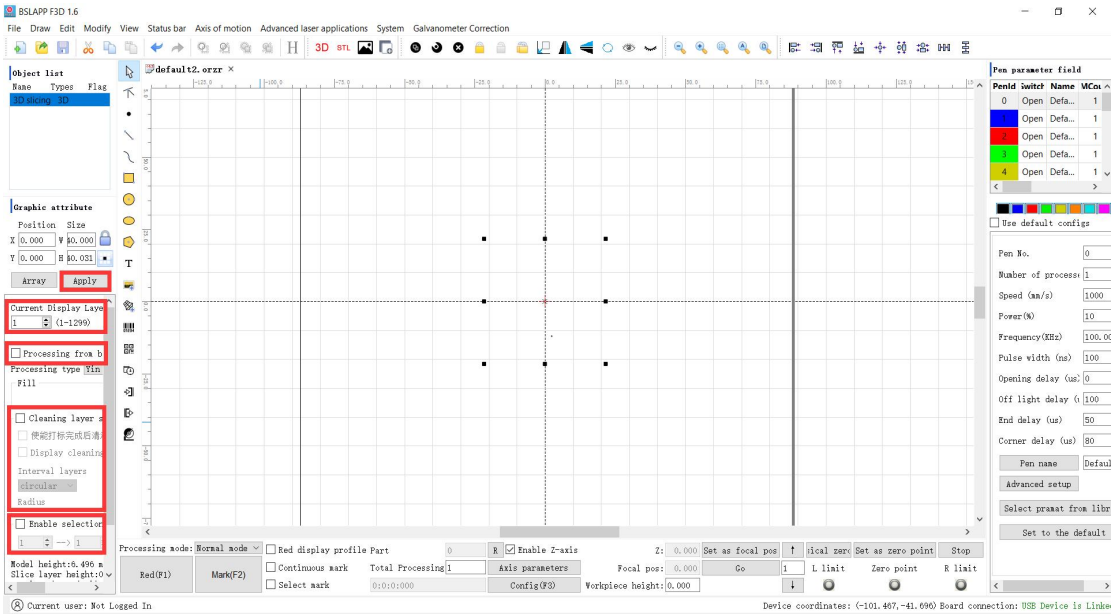
Refer to the filling mode on the reference image, and the smaller the line spacing, the longer the carving time, but it will also be more delicate. The larger the line spacing, the shorter the carving time, making it rougher

Processing mode: **3D mode** After filling, the Processing mode must be selected to 3D mode



This is the adjustment of the engraving pen number and parameters. The more slices there are, the lower the power can be, and the less slices there are, the higher the power can be.

Only in this way can the automatic focusing function that moves slowly downwards during the Z-axis engraving process be combined to make the engraving deeper and keep the laser focus on the engraving surface throughout the engraving process



Current Display Layer:

1 (1-650)

You can check if the layers are correct and identify which ones are invalid. In the future, skip the invalid layers and do not cut them

Processing from bottom

You can choose to carve from bottom to top here, which defaults to top to bottom. You can use it if needed or in special circumstances

Cleaning layer set

Clean after enable

Display cleaning

Interval layers

circular

Radius

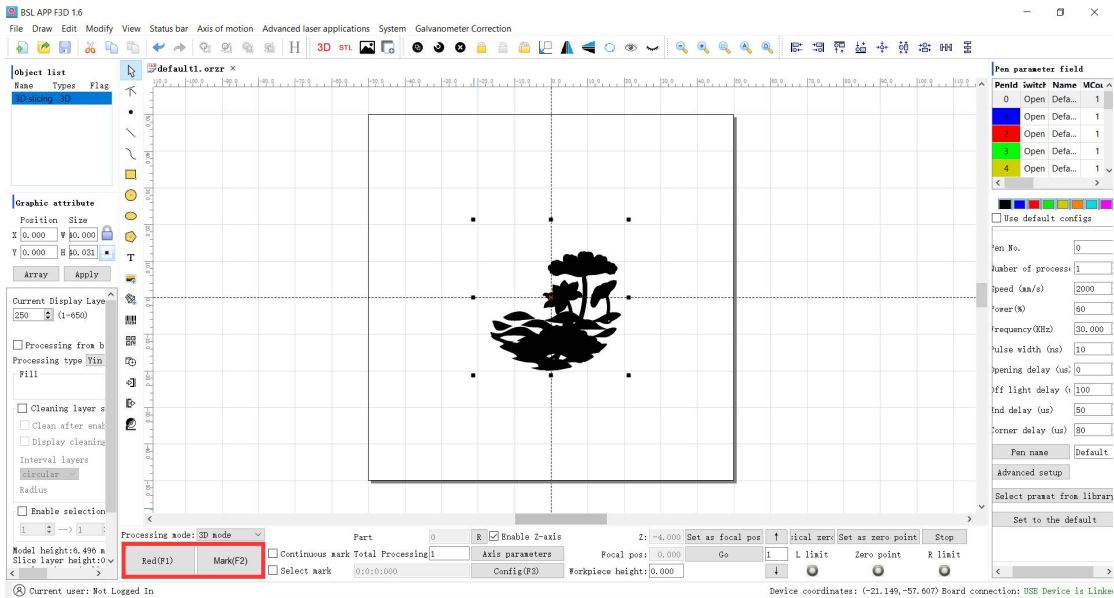
Set the cleaning outer contour, set the filling parameters separately for the cleaning layer, and set the cleaning interval layer.

Enable selection

1 --> 1

Select the carving layer, which defaults to hitting from 1 to

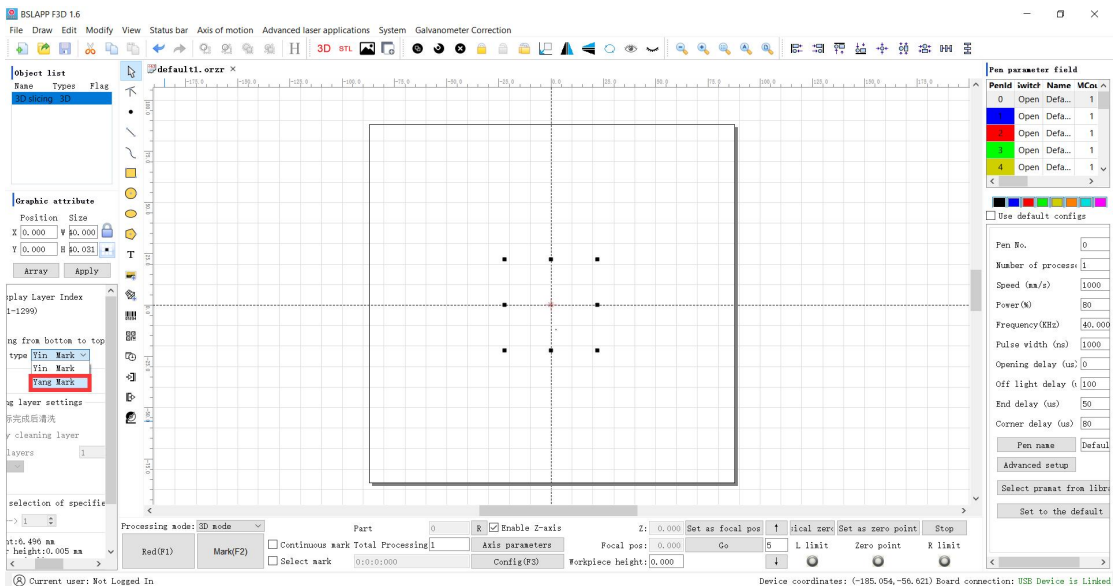
the end. If there are layers at the beginning and end that do not need to be hit, they can be skipped here



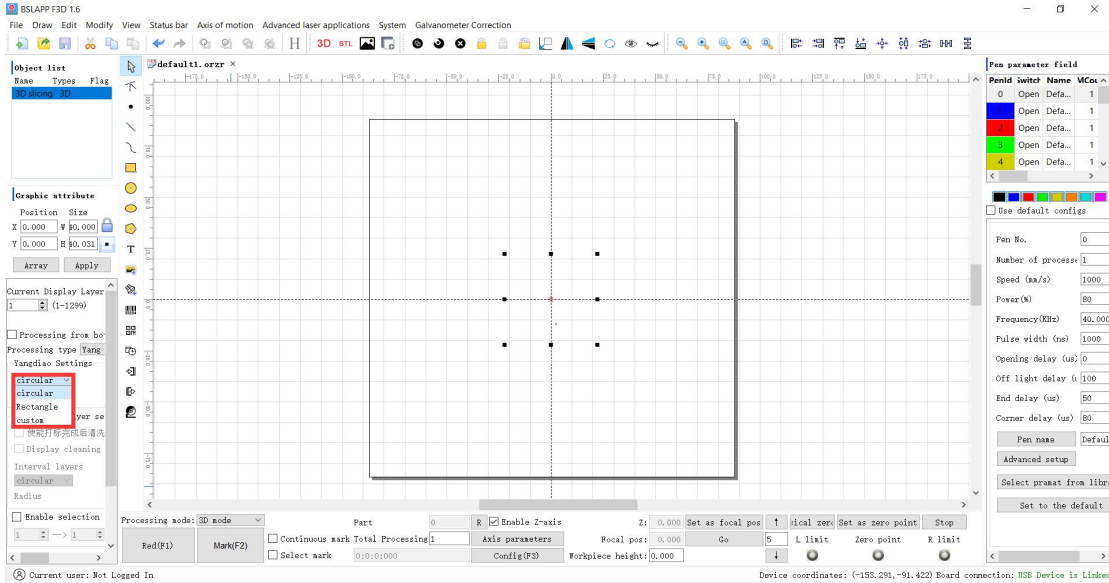
After confirming the focus, the required carving layer, and the laser parameters, you can click on the red light and confirm the position, then click on Mark to start working

Finally, summarize the process: Import 3D model → 3D model slicing → Slice attribute modification → Slice element filling → Select 3D machining mode → 3D machining.

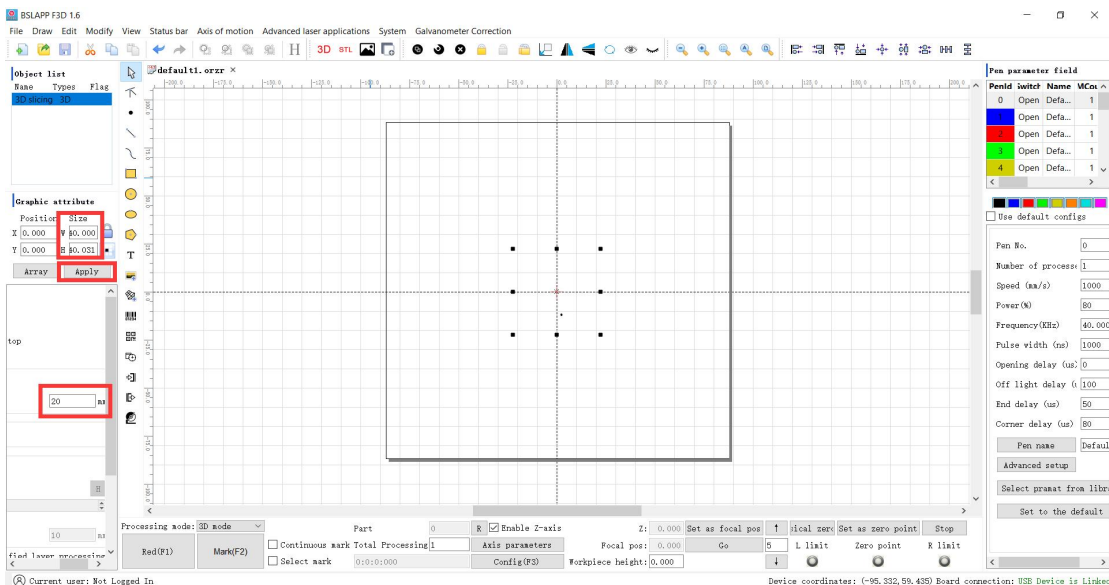
8.2 2.5D Yang (Relief) Marking - 3D file format



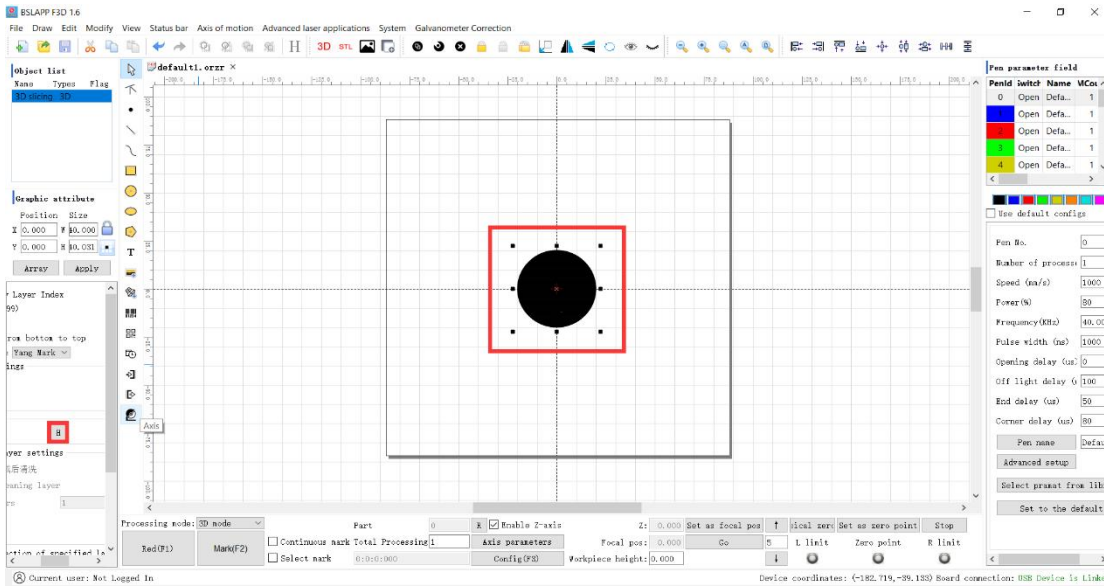
After importing the 3D file and slicing it, select Yang Mark mode



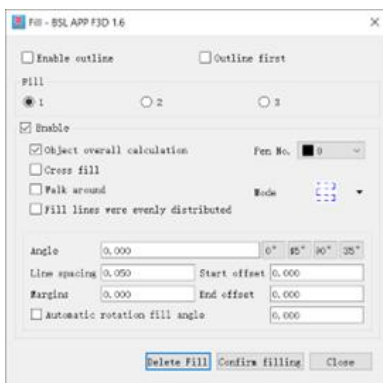
Choose the outer frame shape based on the carved shape or according to your own needs



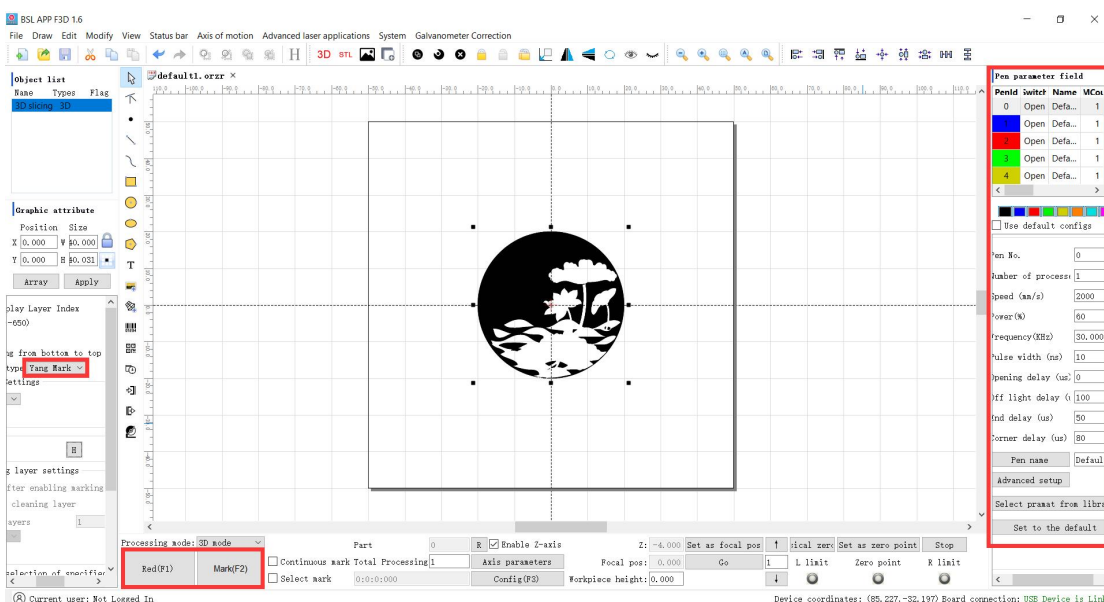
After selecting, adjust the outer frame size according to the shape or the desired outline size
For example, if the shape that needs to be carved on the picture is 40mm, I will set the radius of the circle, selected to 20MM, and then click APPLY



Click **H** to fill the outer contour



Filling mode on the reference image, and the smaller the line spacing, the longer the carving time, but it will also be more delicate. The larger the line spacing, the shorter the carving time, making it rougher

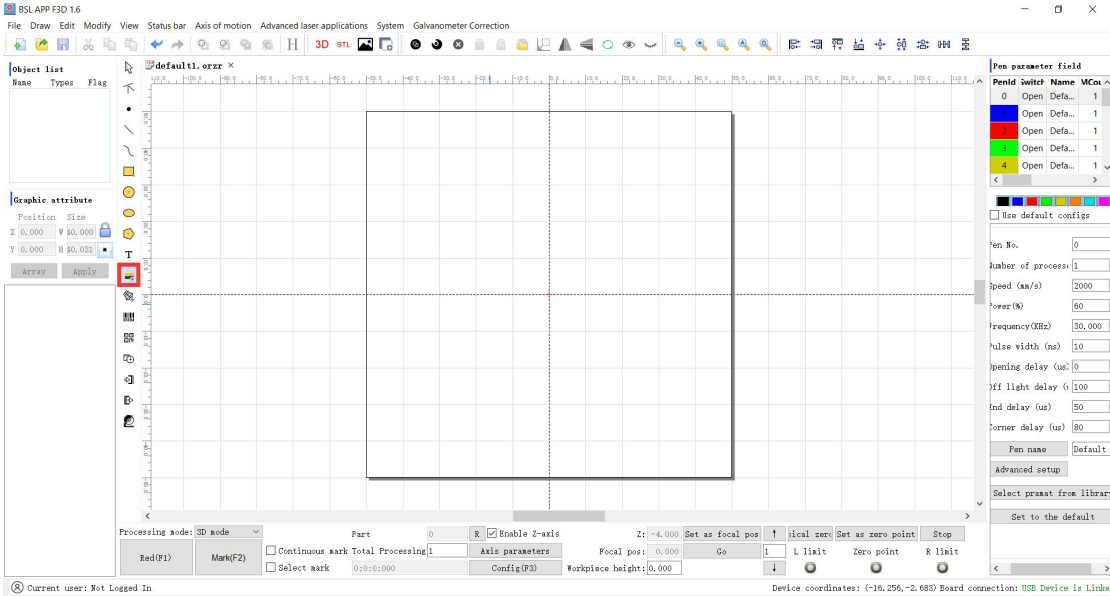



After confirming the focus, the required carving layer, and the laser parameters, you can click on

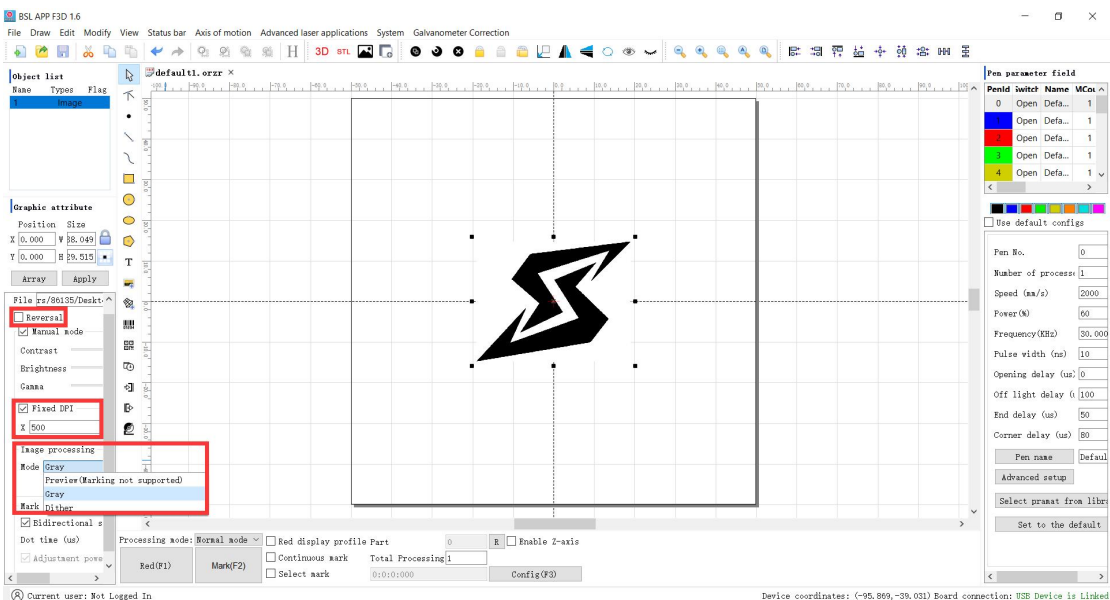
the red light and confirm the position, then click on Mark to start working

All steps of Yang carving are the same as Yin carving, the only difference is to change the carving mode and draw a frame for filling

8.3 2.5D Yin/Yang Marking - bitmap file format



Click  and then left click on the blank space to import the bitmap that needs to be carved



Mode **Gray** Select Gray mode for bitmap marking

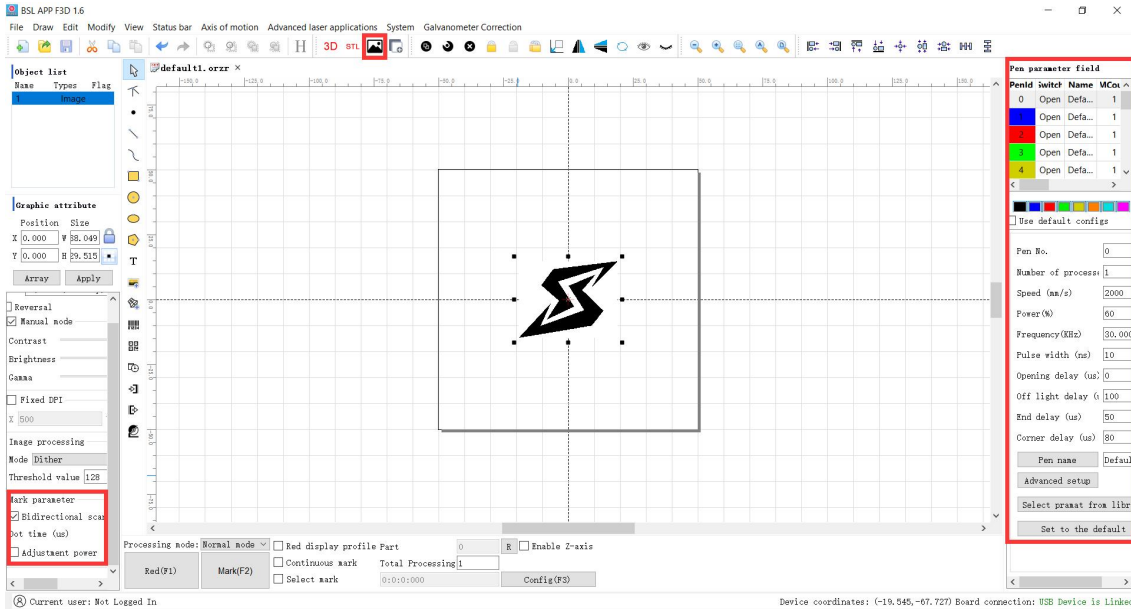
Fixed DPI

X 500

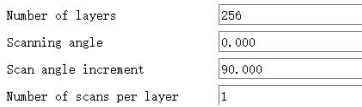
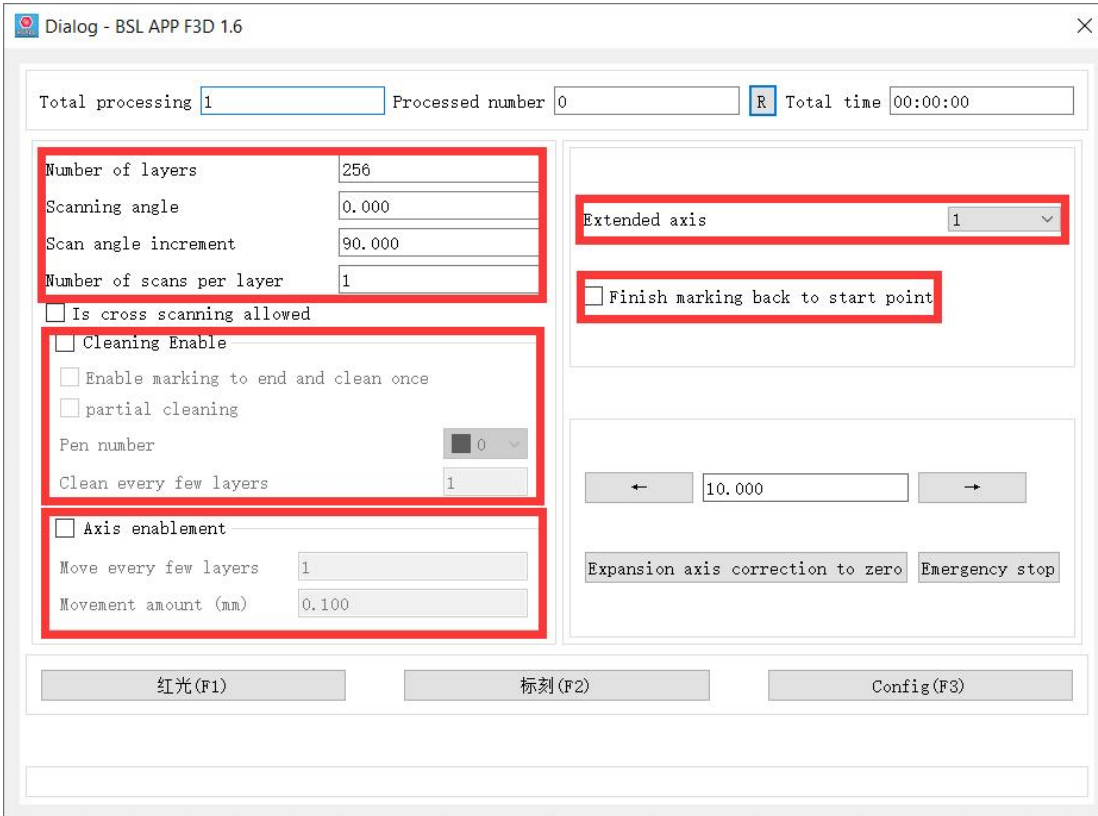
Adjust the pixel size according to actual needs, with a default range of 450-500

Reversal

If you need to do Yang marking, please check the option for reverse. Currently, only solid color backgrounds are supported for Yang marking



This is the bidirectional scan dot time, the dot time for each pixel point. The longer the dotting time, the higher the power, and the shorter the dotting time, the lower the power. It is adjusted according to different materials, with a default of 200us
After setting the parameters of the laser on the right, click to enter the bitmap deep carving interface. Currently, only bitmap backgrounds with solid colors are supported



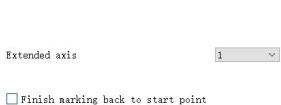
Select the angle of the number of layers to be carved and the number of scans per layer here



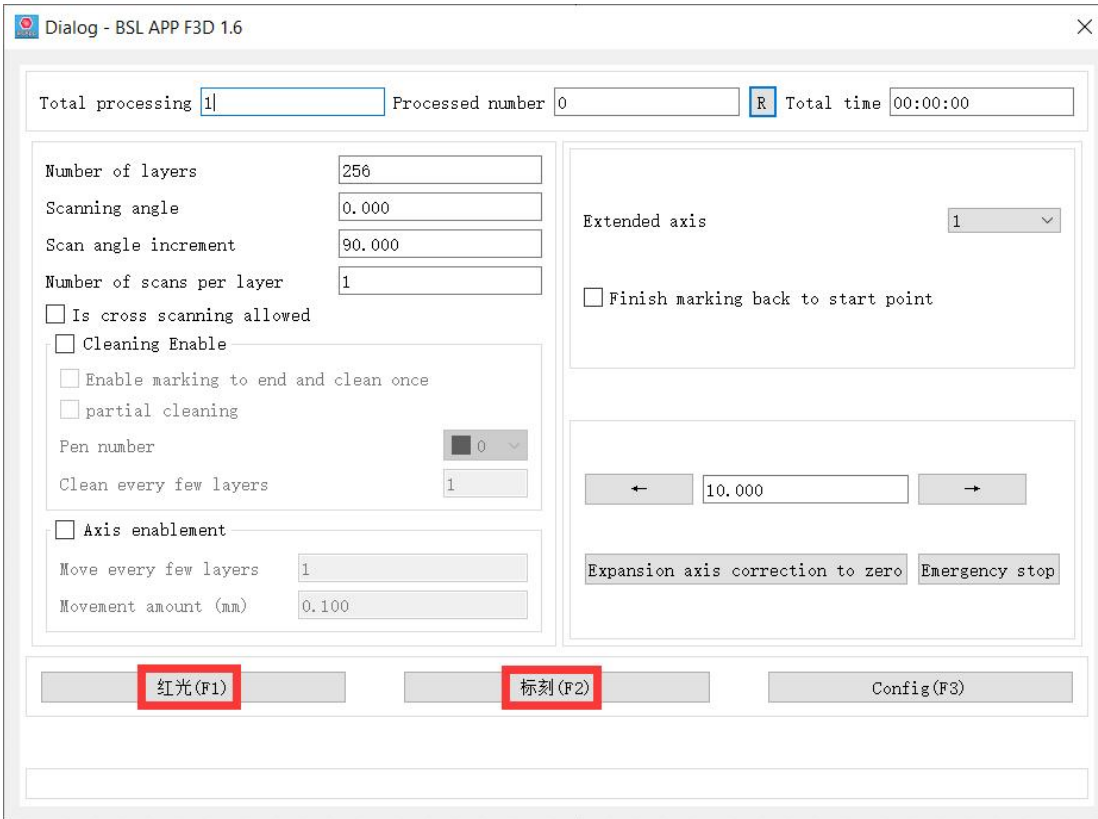
This is the carving process where different pen numbers can be set for carving cleaning settings. Cleaning off the surface dirt will make the graphics look neater



The default setting is 1 axis, and the specific distance traveled depends on the laser parameters. The higher the laser power setting, the appropriate distance can be increased, while the lower the laser power setting, the appropriate distance can be reduced



If you need to carve back to zero, check and select the top axis 1

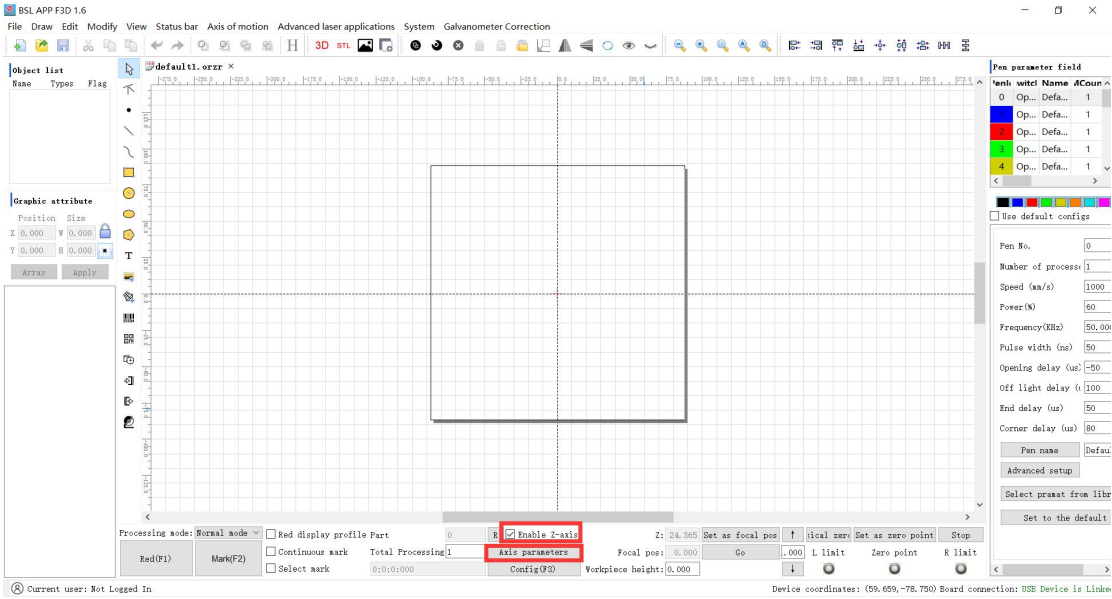


After confirming the laser and engraving parameters, you can select the red light (F1) for alignment and then mark (F2)

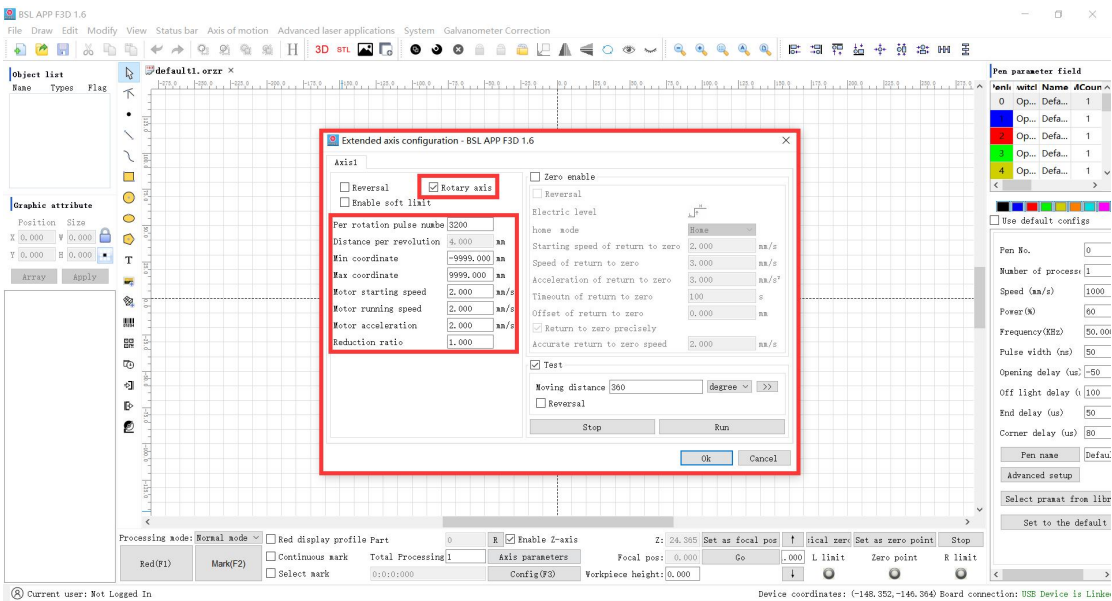
9. Rotary axis Setting

Fix the item with a rotary axis



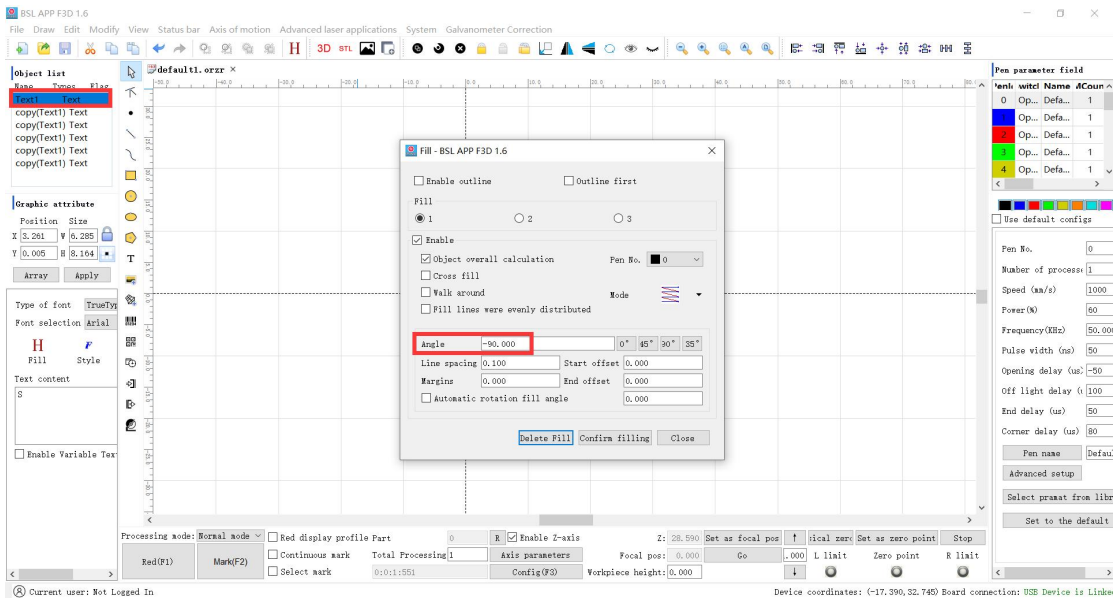
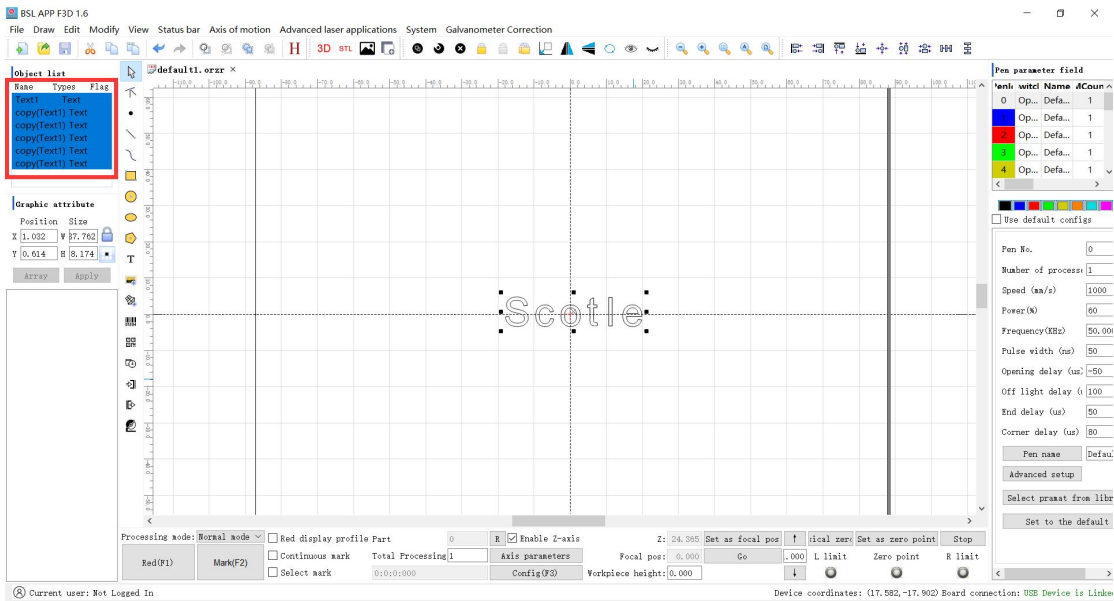


Enable Z-axis First check this, then click **Axis parameters** to enter axis parameter settings

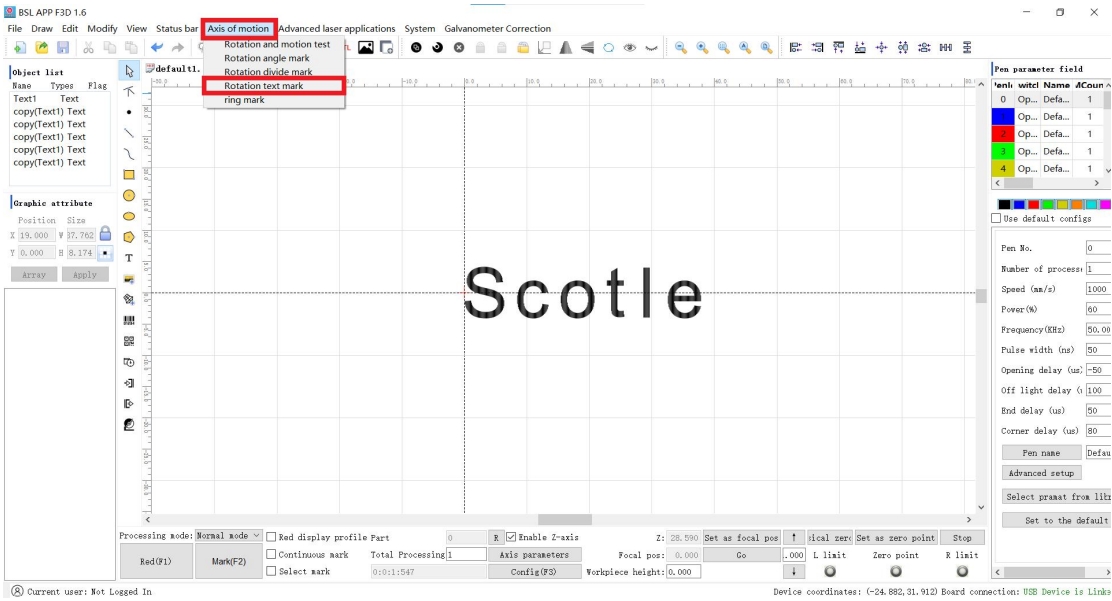


Follow the parameter settings in the above picture

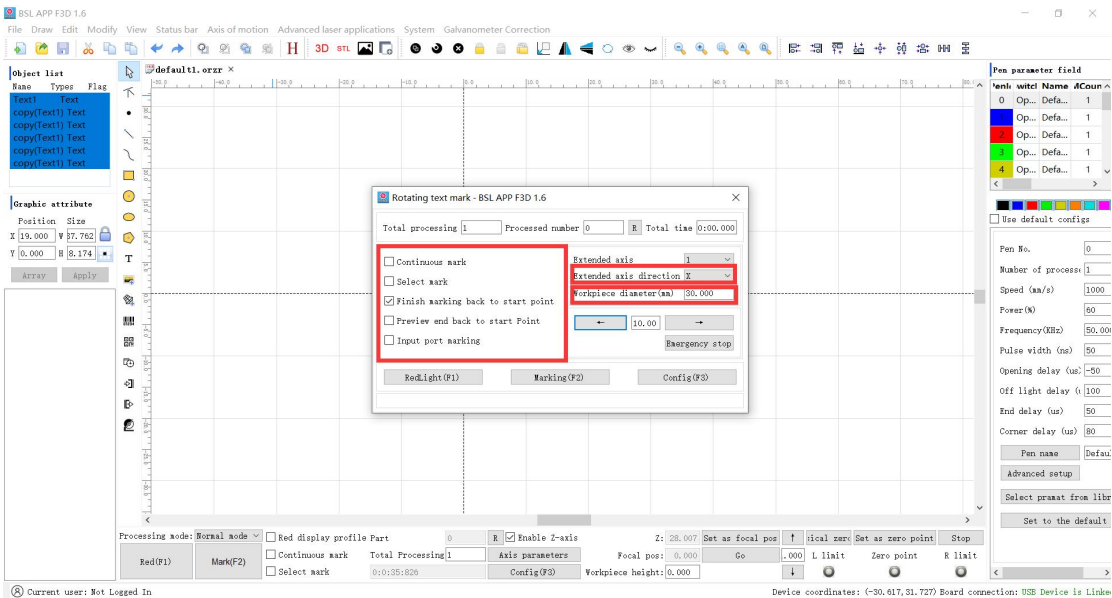
Rotary axis Text Marking



Input a filling angle of -90 degrees, because the rotary axis is set to rotate counterclockwise, so the corresponding filling angle needs to be filled horizontally by 90 degrees, either -90 degrees. If multiple texts need to be marked, they need to be filled with angles one by one.



Select the rotation text mark



You can select the required functions according to actual needs

- Continuous mark
- Select mark
- Finish marking back to start point
- Preview end back to start Point
- Input port marking

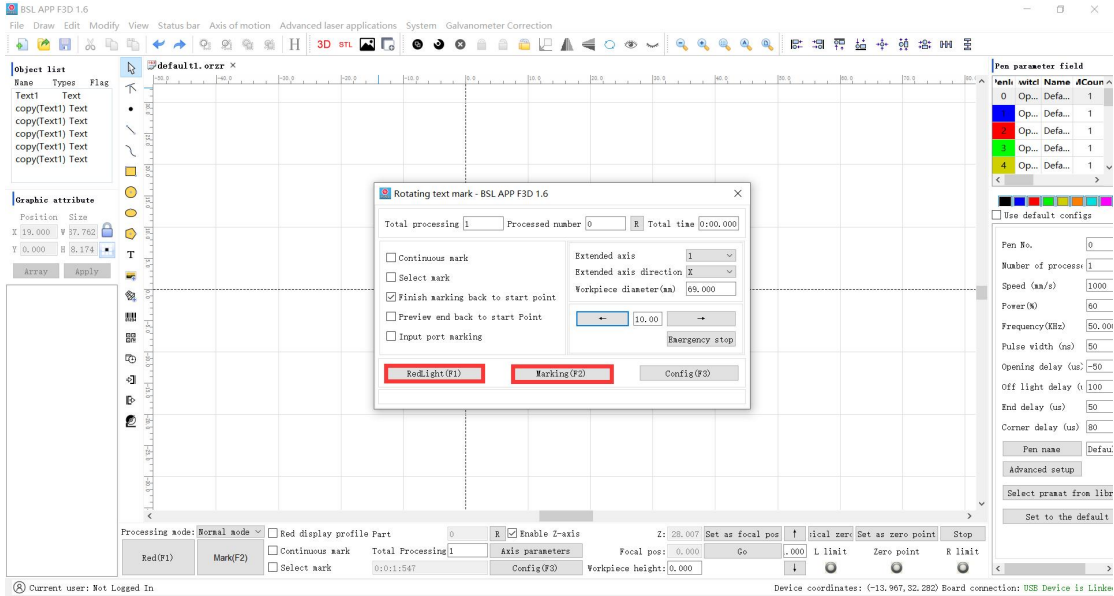
Extended axis

Extended axis direction

Select the 1st expansion axis and X-axis here

Workpiece diameter(mm)

Fill in according to the diameter of the workpiece. The larger the diameter, the smaller the spacing between the rotating marking letters. The smaller the diameter, the larger the spacing between the rotating marking letters

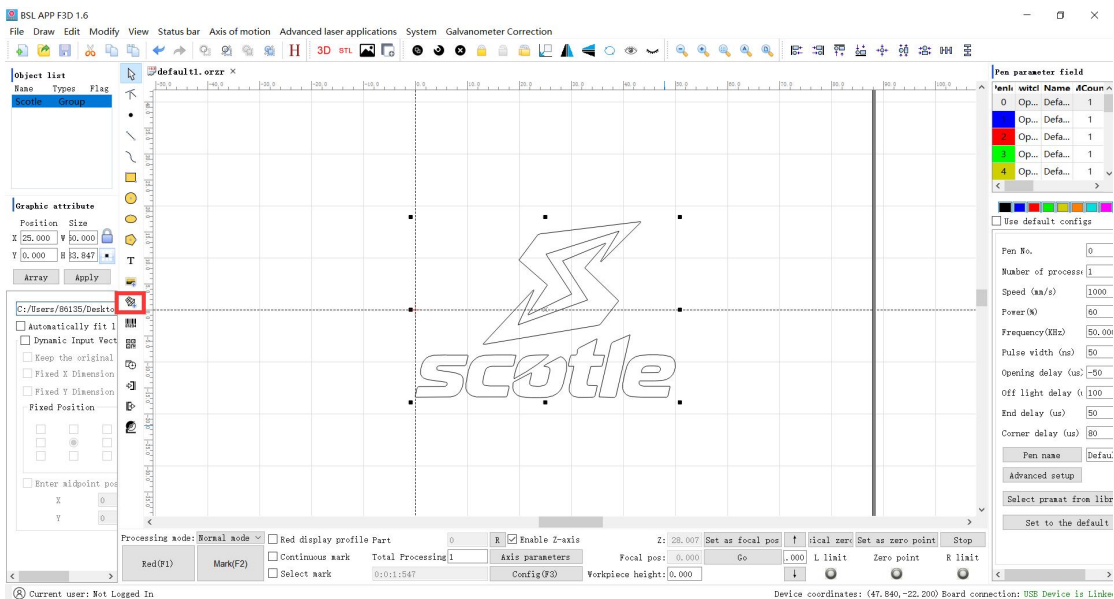


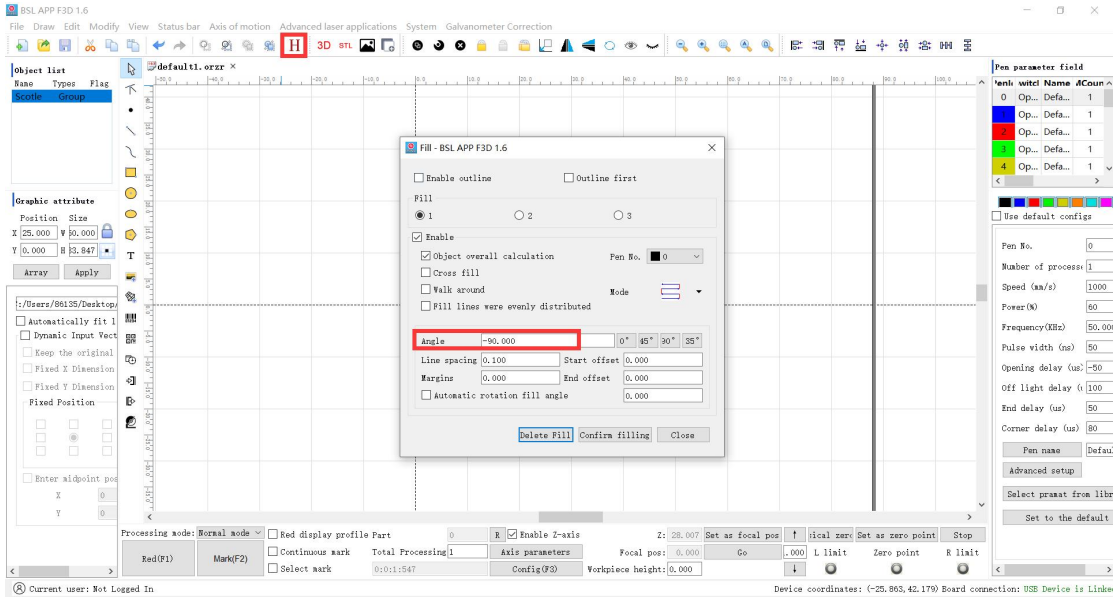
Click F1 to start the red light indicating the position of the first letter, which is the first letter at the beginning of the rotation marking. The subsequent rotation marking will be done sequentially

After determining the location, click F2 to start marking and it will automatically work

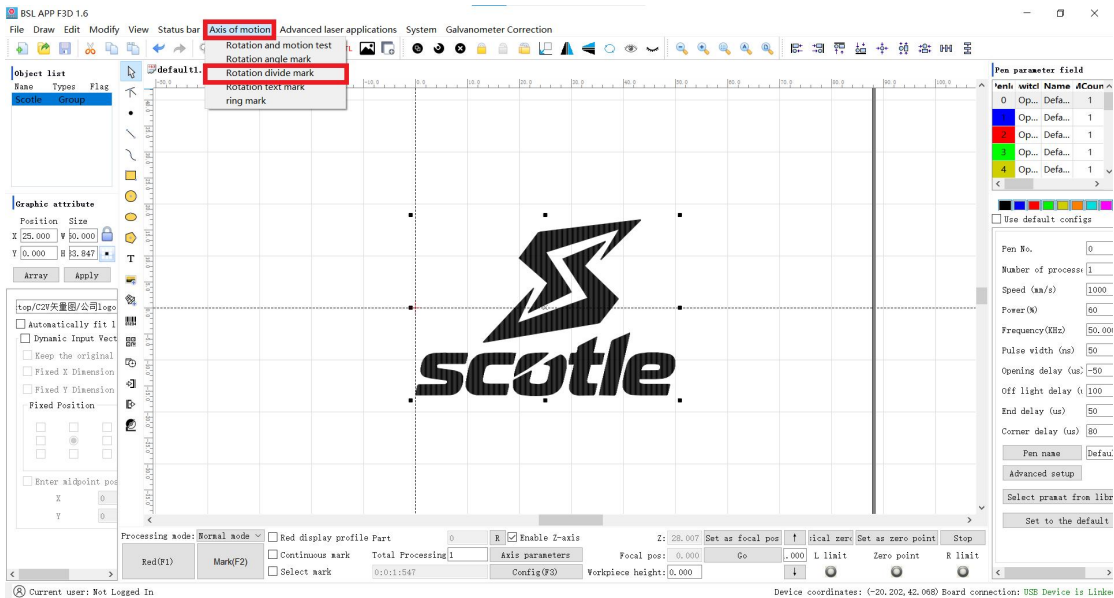
9.1 Vector image marking

Import the vector image

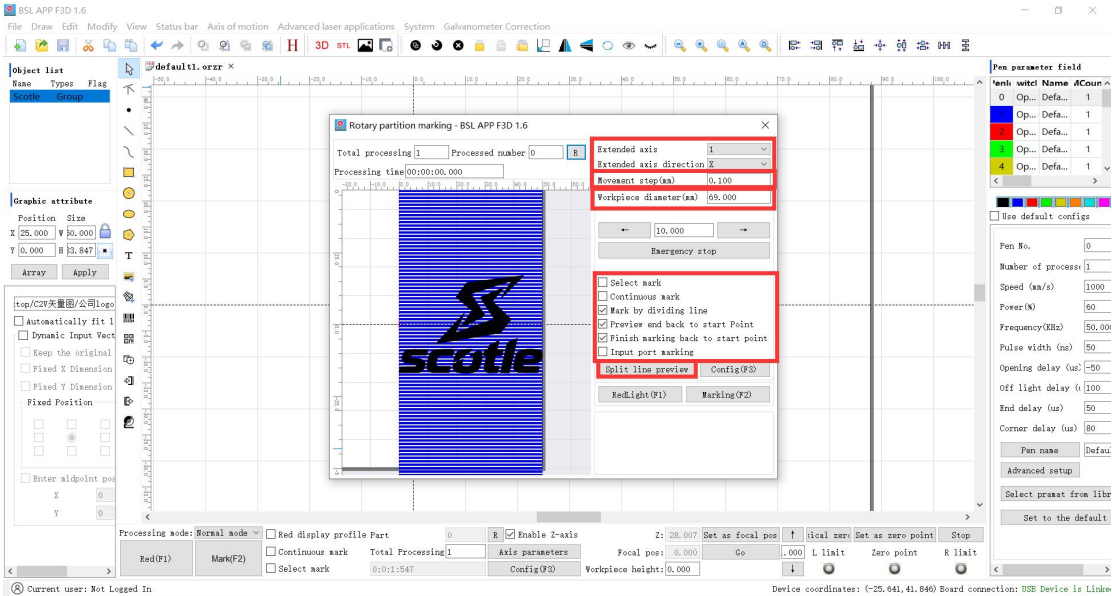




Click **H** to enter the fill page, fill in the angle of -90 degrees



Click on the split rotation mark.



Extended axis

Extended axis direction

Rotate and expand axis 1 and set it to the X-axis

Movement step (mm)

The movement step size is set to 0.1MM, the smaller it is, the denser it is

Click

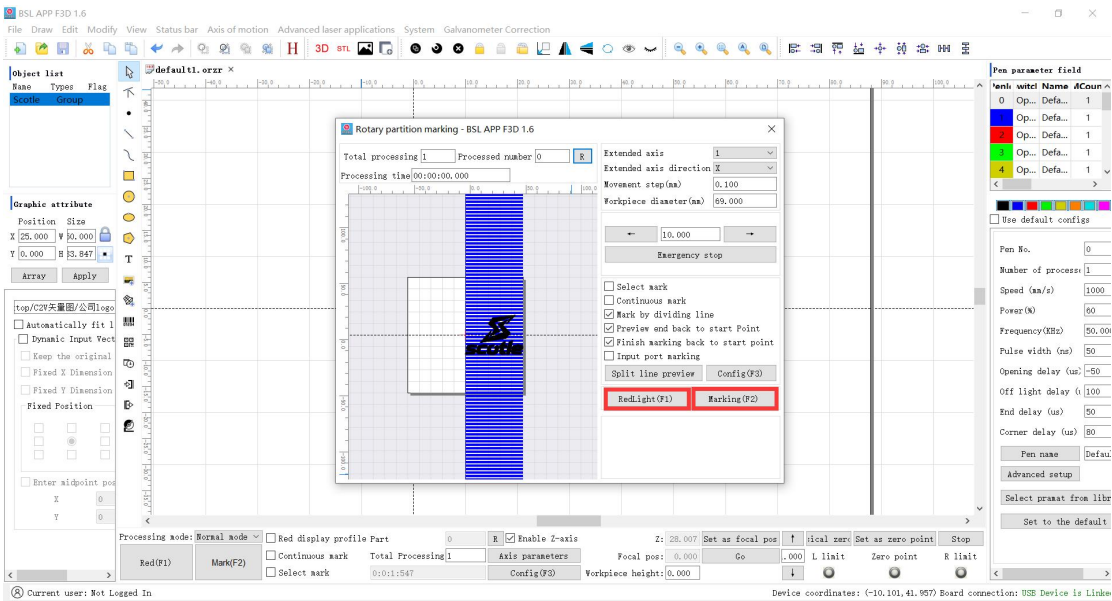
to check the style of setting the motion step size corresponding to the marking content

Workpiece diameter (mm)

Fill in the actual diameter of the workpiece

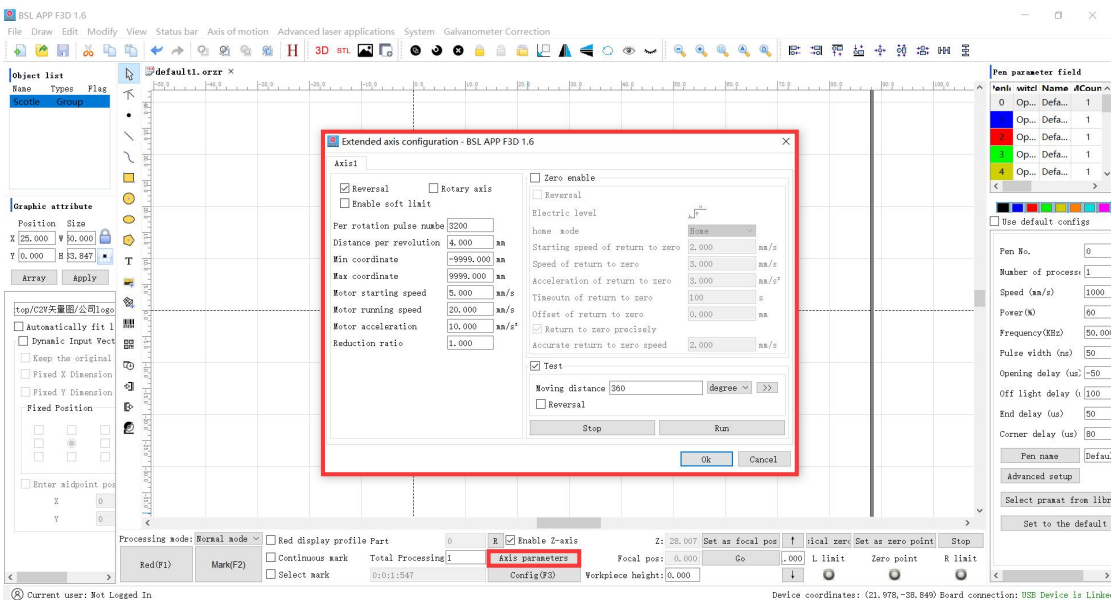
You can select the required functions according to actual needs

- Select mark
- Continuous mark
- Mark by dividing line
- Preview end back to start Point
- Finish marking back to start point
- Input port marking



Then click on F1 red light preview, place the position of the red light preview at the starting position where you need to mark, and you can click F2 to start marking. The entire rotation will automatically run.

10.How to switch back to Z-axis settings



Connect the Z-axis motor wire to the host and click Axis parameters to enter the interface that matches the settings on the diagram to restore the Z-axis parameters.

11. Precautionary note

This device has an output wavelength of 1064nm (invisible light) and an average output power of over 200W. It is classified as a Class IV laser, which not only poses great harm to the eyes but also burns the skin. Its reflected and scattered light may also cause harm to the human body. Therefore, please wear OD4+grade laser protective goggles throughout use.

The irradiance that may incident on the surface of the goggles is 0.01W/m². Do not directly observe the laser output head. It is recommended to wear laser protective goggles throughout the operation!

We prepare this protective goggles for the device, Optical density test results:

wavelength (nm)	optical density
1064	>6



When you don't need this device to work, be sure to keep the laser switch off and inform children to stay away from the device, avoid accidental contact with the danger laser.

12.Q&A

Q: What should I do if the U-Disk is not found in the package?

A: This is because the customs took out the U disk during customs clearance. Please contact customer service in time and leave your email. We will send you the U-Disk Files.

Q: Can I use Lightburn software to control the machine

A: 2D marking supports Lightburn software, 2.5D marking does not support Lightburn software.

Q: Can this 2.5D machine make relief engraving? deep engraving?

A: Yes, this machine can do deep engraving and relief engraving well, the BSL software can switch between deep engraving and relief engraving with one click.

Q: I bought a machine with a 200x200mm field lens, can I change other size field lens?

A: Yes. You can buy another working area lens from us, contact us please.